

S198434

IN THE SUPREME COURT OF THE STATE OF CALIFORNIA

THE PEOPLE OF THE STATE OF CALIFORNIA,

Plaintiff and Respondent,

v.

ZACHARY DAVIS,

Defendant and Appellant.

) No. _____
)
) 2d Crim. B229615
)
) Los Angeles County
) Sup.Ct.No. BA367204

SUPREME COURT
FILED

DEC 5 - 2011

Fredrick W. Ohlrich Clerk
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PETITION FOR REVIEW

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) Sup.Ct.No. BA367204
ZACHARY DAVIS,)
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Defendant and Appellant.)
_____)

PETITION FOR REVIEW

TO: THE HONORABLE TANI CANTIL-SAKAUYE, CHIEF JUSTICE, AND THE HONORABLE ASSOCIATE JUSTICES OF THE SUPREME COURT OF THE STATE OF CALIFORNIA:

Pursuant to California Rules of Court rule 8.500 (a)(1), appellant, Zachary Davis, respectfully requests that this Court review the published decision of the Court of Appeal, Second Appellate District, Division Four, which affirmed his conviction. A copy of the Court of Appeal's opinion, filed October 26, 2011 is attached as Exhibit A. Appellant did not file a Petition for Rehearing.

Review is sought pursuant to California Rules of Court rule 8.500 (b)(1), to settle important questions of law and to resolve conflicting appellate court opinions.

QUESTION PRESENTED

Given that the substance MDMA is not listed as a controlled substance banned by Health and Safety Code sections 11377 and 11379, must the prosecution present evidence that MDMA contains or is an analog of a listed controlled substance in order to convict under these sections?

Is it permissible for the Court of Appeal to take judicial notice of statements in scientific treatises concerning the nature of MDMA as a controlled substance, when that evidence was never presented to the trial court for appellant to rebut or contradict?

NECESSITY FOR REVIEW

A jury convicted appellant of one count of a violation of Health and Safety Code section 11377 and one count of Health and Safety Code section 11379, based on his having sold MDMA to an undercover police officer. However, MDMA, or “methylenedioxymethamphetamine,” is not explicitly named under either of these code sections as a banned controlled substance. (*People v. Becker* (2010) 183 Cal.App.4th 1151, 1155.)

At trial, the prosecution offered the testimony of a chemist that the substance was MDMA, but presented no evidence that MDMA contained a banned controlled substance. The prosecution presented no evidence that MDMA was an analog of any banned controlled substance, per Health and Safety Code section 11401, subdivision (b). The

trial court simply instructed the jury that the prosecution only need to prove that “the controlled substance was methylenedioxymethamphetamine, commonly called ecstasy.” (RT 920-921.)

Existing case law dictates that a prosecutor must actually prove, generally through expert testimony, that MDMA either contains a controlled substance or is an analog of a controlled substance. (*People v. Silver* (1991) 230 Cal.App.3d 389, 396-398; *People v. Becker, supra*, 183 Cal.App.4th at 1156.) On the basis of this precedent, appellant challenged the sufficiency of the evidence of his violation of these laws.

While appellant’s case was pending, Division Two of the Court of Appeal, Second District, issued an opinion that was dispositive of the issue in this case. The Court in *People v. Le* (2011) 198 Cal.App.4th 1031 concluded that “... [in order to prove that MDMA is a controlled substance], the prosecution must offer an expert who testifies that the language of a controlled substance statute or the analog statute has been satisfied.” (*Id.*, at pp. 1037-1038.) The *Le* Court stated that “there is no doctrine that permits a trial court (or the trier of fact) to conclude that 3, 4-methylenedioxymethamphetamine contains amphetamine merely because their names are similar.” (*Id.*, at p. 1038.)

In the present case, the Court of Appeal disagreed with the *Le* decision and refused to follow it. This panel agreed that, under the *Le* formulation of the law, they would have to overturn appellant’s conviction. (Opinion, p. 5.) In their opinion, they directly contradicted *Le*, saying that because of the similarity of the names of the substance, the

trier of fact could infer that the MDMA pills contained methamphetamine. (Opinion, p. 6.) This Court should grant review in order to resolve the split in the law concerning what evidence is sufficient to prove whether or not MDMA is a banned controlled substance.

To support its position, the Court of Appeal took judicial notice, pursuant to Evidence Code section 452, subdivision (h), of several articles from scientific treatises that addressed the relationship between MDMA and methamphetamine. The prosecutor had not presented this or any scientific evidence at trial, and so, appellant had no opportunity to challenge it before the trier of fact. The admission by judicial notice of this additional evidence violates the “general rule that an appellate court generally is not the forum in which to develop an additional factual record (*People v. Peevy* (1998) 17 Cal.4th 1184, 1207.) This Court should grant review to determine whether or not the Court of Appeal may take judicial notice of factual material that was not contested in trial when making a determination as to the sufficiency of evidence at trial.

STATEMENTS OF CASE AND FACTS

Appellant sold two blue pills to an undercover police officer who was working as part of a sting operation targeting drug dealers at a rave party at the Coliseum in Los Angeles. (RT pp. 331, 334, 349.) The sale was made in response to undercover officer Romeo Rubalcava's solicitation for "E," or "ecstasy," a slang for methylenedioxymethamphetamine ("MDMA"). (RT p. 338.)

Officer Rubalcava testified that this sale was his first undercover buy involving MDMA, though his unit had made about a dozen such arrests. (RT p. 331.) His knowledge of MDMA was limited. People had told him a bit about the effects of MDMA and that they could last as long as twenty-four hours. (RT pp. 364- 365, 370.) He admitted not knowing much else about MDMA or its effect, except that it was "a party drug, a raiser drug." (RT pp. 366, 331.) He did not elaborate on this description and made no comparison of MDMA to any controlled substance in terms of its effect. He also said nothing about its chemical make-up, admitting that he did not know about its manufacture or processing. (RT p. 368.) The bulk of his training involved learning the "verbiage" of MDMA sales. (RT p. 379- 380.)

A criminalist from the LAPD Crime Lab, Wubayehu Tsega, testified that the blue pills which Officer Rubalcava bought from appellant were MDMA. (RT p. 708.) He stated that he conducted tests comparing the chemical structure of the pills with the chemical structure of a known MDMA sample, and that the two were the same. (RT p.

707-- 708.) The criminalist did not compare the chemical structure of the pills to any explicitly named controlled substance, and he did not testify to anything that would indicate that the pills were substantially similar in chemical structure to any controlled substance. (RT p. 701– 709.) He gave no testimony about the effects of MDMA. (RT p. 701– 709.)

The jury found appellant guilty of violations of Health and Safety Code sections 11379 and 11377. The trial court sentenced him to three years of formal probation, with conditions including ninety days in county jail. Appellant appealed.

After briefing was completed on the appeal, the Court notified appellant of its intent to take judicial notice of several scientific articles or treatises. A copy of the Court's notice and of the materials presented are attached as Exhibit B. The Court of Appeal, Second Appellate District, Division Four, affirmed the judgment.

**THE PROSECUTION PRESENTED NO SUBSTANTIAL
EVIDENCE THAT THE MDMA POSSESSED AND
SOLD BY APPELLANT WAS A CONTROLLED
SUBSTANCE OR ANALOG WITHIN THE MEANING
OF THE CHARGING STATUTES.**

A guilty finding based on evidence that is insufficient to prove that guilt beyond a reasonable doubt violates the Sixth Amendment guarantee of a fair trial and the Fifth Amendment right to due process, made applicable to the states through the Fourteenth Amendment to the federal constitution. (*Jackson v. Virginia* (1979) 443 U.S. 307, 316-318.) A conviction without adequate support violates the due process clause of Article I, section 15 of the California Constitution. (*People v. Rowland* (1992) 4 Cal.4th 238, 269; *In re Alexander* (2007) 149 Cal.App.4th 605, 610.) A defendant in a criminal case is constitutionally entitled under the Fifth, Sixth and Fourteenth Amendments and the California Constitution to have the jury decide all issues of fact by proof beyond a reasonable doubt. (*United States v. Booker* (2005) 543 U.S. 220, 232; *Apprendi v. New Jersey* (2000) 530 U.S. 466, 469; *People v. Rowland, supra*, 4 Cal.4th at 269.)

To show violations of Health and Safety Code sections 11379 and 11377, the prosecution must prove that the items possessed and sold were in fact controlled substances banned under these sections. The Court of Appeal acknowledged that MDMA is not listed explicitly as a controlled substance under any of the statutes cited by these two code sections. (Opinion, p. 3; see also *People v. Becker, supra*, 183 Cal.App.4th at 1155.)

A prosecutor may show that possession for sale of MDMA may violate these code sections if the prosecutor can show through expert testimony that either it contains a controlled substance or that it is an analog of a controlled substance per Health and Safety Code section 11401, subdivision (b). (*People v. Le, supra*, 198 Cal.App.4th at 1037-1038.) To be considered an analog, the substance must have either a substantially similar chemical structure to a classified controlled substance or have a substantially similar effect to such a controlled substance. (Health & Saf. Code, § 11401, subd. (b).)

In the case *People v. Silver* (1991) 230 Cal.App.3d 389, the defendant challenged his conviction on the grounds that there was insufficient evidence to prove that the MDMA he possessed and sold was a controlled substance. The prosecution and defense each presented two experts who gave conflicting testimony as to whether or not MDMA was an analog of methamphetamine. (*Id.*, at 392-393.) The Court held that the jury was properly instructed that it must determine whether or not the prosecutor met the requirements of the analog statute. (*Id.*, at 397-398.) The Court rejected the defendant's insufficiency argument because it found that a rational jury could have believed the prosecution experts over those of the defense. (*Id.*, at 396.) Unlike *Silver*, in the present case, there were no expert witnesses for the prosecution testifying to the effects or chemical structure of MDMA in relationship to any controlled substance.

The case *People v. Becker* (2010) 183 Cal.App.4th 1151, similarly notes that MDMA is not listed as a controlled substance under Health and Safety Code section

11377, which includes the same list of substances as section 11379. (*Id.*, at 1155.) At trial, the prosecutor in *Becker* offered expert testimony describing MDMA as including methamphetamine and as having “a stimulant effect substantially similar to the stimulant effect of methamphetamine.” (*Id.*, at 1156.) The Court said that because of this testimony, the jury could have concluded that MDMA was either a controlled substance or an analog to a controlled substance. (*Ibid.*) Therefore, there was substantial evidence to support the conviction. In the present case, again in contrast to *Becker*, the prosecution presents no evidence that MDMA contains methamphetamine or that it is substantially similar in chemical make-up or effect.

The Court of Appeal in the present case attempts to limit the holdings of *Becker* and *Silver* by saying that “neither decision suggests that [testimony comparing MDMA to an enumerated controlled substance] is necessary to uphold a jury’s guilty verdict on appeal.” (Opinion, p. 5.) The Court is correct that neither opinion makes that suggestion in those exact words. However, both opinions discuss at length the fact that MDMA is not a named controlled substance. Then they state how despite that fact, it is possible for the prosecutor to prove the violation by use of expert testimony comparing MDMA to the controlled substance methamphetamine.

People v. Le (2011) 198 Cal.App.4th 1031 makes explicit the point about the need for further evidence to prove a violation beyond simply identifying the substance as MDMA. In *Le*, as with the present case, the prosecution simply identified the pills as

MDMA without any testimony comparing or identifying them with a controlled substance named in the statute. The *Le* Court faulted the trial judge for simply assuming that because the word “amphetamine” is in the chemical name for MDMA, that the jury did not need some further evidence that it contains a controlled substance or is an analog. (*Id.*, at 1037.) It said that there is no legal doctrine that allows the trier of fact or the trial judge to conclude that MDMA contains amphetamine just because the word “amphetamine” is in its name. (*Ibid.*) The court held that “... the prosecutor must offer an expert who testifies that the language of a controlled substance or the analog statute has been satisfied.” (*Id.*, at 1038.)

In the present case, the Court of Appeal acknowledged that they would have to overturn appellant’s conviction if they followed *Le*, given the lack of any expert testimony to show that MDMA meets the definition of a controlled substance or an analog. (Opinion, p. 5.) However, they explicitly rejected *Le*’s holding, and the implied holdings of *Silver* and *Becker*, stating that because the chemical name includes the term “methamphetamine,” the trier of fact can conclude that the substance contains methamphetamine. (Opinion, p. 6.) This holding cites no authority as support, but claims to “apply common sense.” (Opinion, p. 6.) The opinion does not account for the effect that the processing of the chemicals that make up MDMA has on its component parts or what the “methylenedioxy” part actual means and how it effects the chemical structure of MDMA. Under *Le*, the prosecution would have to present evidence to answer these

question and expose those answers to challenge through cross-examination and from experts who may disagree.

The holding in this case, if allowed to stand, limits appellant's right to a fair trial and right to confront the witnesses against him, because it simply re-writes the statute to say that MDMA is banned because it has the name of an enumerated controlled substance as part of its name. This Court should grant review to resolve the conflict between this case and *Le, Becker* and *Silver*.

**THE COURT OF APPEAL DENIED APPELLANT
HIS RIGHT TO A FAIR TRIAL BY IMPROPERLY
TAKING JUDICIAL NOTICE OF EVIDENCE THAT
SUBSTANTIATES AN ELEMENT OF
THE CRIME.**

Citing Evidence Code section 452, subdivision (h), the Court of Appeal took judicial notice of several scientific articles which relate to MDMA and methamphetamine. It drew the conclusion from these articles that MDMA is derived from methamphetamine and amphetamine. (Opinion, p. 7.) Based on the articles stating that MDMA is a derivative of these controlled substances, the Court concluded that "it may be inferred that MDMA contains some quantity of methamphetamine or amphetamine" (Opinion, p. 7.) They cited to no case law which supports their inference, nor do they explain the chemical process by which MDMA is derived or

whether at the end of the process MDMA retains the character or chemical structure of its component parts.¹ None of these articles were in evidence in the trial court.

Evidence Code section 452, subdivision (h) allows a court to take judicial notice of “facts and propositions that are not reasonably subject to dispute and are capable of immediate and accurate determination by resort to sources of reasonably indisputable accuracy.” In the *Silver* case, the defendant presented expert testimony from a forensic toxicologist that, “MDMA and methamphetamine were not similar; that only 50 percent of the molecules were the same or similar; that it was impossible to create a molecule of MDMA from a molecule of methamphetamine; and that they were ‘basically different chemical compounds.’” (*People v. Silver, supra*, 230 Cal.App.3d at 392.) This example indicates that there may be some reasonable dispute as to the claim that MDMA contains methamphetamine.

Appellant did not have the opportunity to present testimony from an expert that would question the inference that the Court of Appeal made, because the evidence on which the Court of Appeal relied was not considered at trial. In the case *People v. Peevy* (1998) 17 Cal.4th 1184, the California Supreme Court rejected the defendant’s efforts to have the appellate court take judicial notice of evidence of a particular police practice

¹ Appellant was not charged with, nor is there any evidence that he was involved with, the manufacturing of MDMA. He can only be held liable for the substance he possessed and sold at the time and not for the substances that may have been part of its manufacture.

relevant to their defense. The Court said that the defendant's efforts to admit this evidence were in "contravention of the general rule that an appellate court generally is not the forum in which to develop an additional factual record, particularly in criminal cases when a jury has not been waived." (*Id.*, at 1207.)

In *People v. Jackson* (1992) 7 Cal.App.4th 1367, the prosecution requested that the appellate court take judicial notice, per Evidence Code section 459, which references section 452, that the defendant's felony prior was a first degree burglary, though the document based on which he admitted the prior only indicated a second degree. The Court rejected the prosecution's request, saying that the trial court must decide the truth of the prior, citing to the "elementary principle that the function of an appellate court, in reviewing a trial court judgment on direct appeal, is limited to matters contained in the record of the trial proceedings." (*Id.*, at 1373.) The *Jackson* Court stressed that there was no authority that allowed an appellate court to prove an essential element of an offense that was not proved in the trial court. (*Ibid.*) In the present case, the Court of Appeal has, through the use of judicial notice, sought to prove the essential element that MDMA is a banned controlled substance, even though the prosecutor failed to present such evidence at trial.

By taking judicial notice of facts needed to prove an essential element of the offense, the appellate court relieves the prosecution of its burden of proof at trial. (*People v. Huntsman* (1984) 152 Cal.App.3d 1074, 1086.) In *Huntsman*, the defendant

appealed denial of his suppression motion. To bolster its case, the prosecution requested that the appellate court take notice, under Evidence Code section 452(g), that narcotics users often package their drugs in ziplock bags. The Court refused to consider evidence not presented in the trial court. (*Ibid.*) The Court reasoned that judicially noticing such evidence would deprive the defendant of his right to cross-examine on the topic and to present his own evidence in rebuttal. (*Ibid.*) In the present case, the Court of Appeal has denied appellant the opportunity to rebut the evidence that it considered by judicial notice. Had the prosecutor presented this evidence at trial, appellant could have presented his own expert to refute or question the assumptions that the Court of Appeal has made.

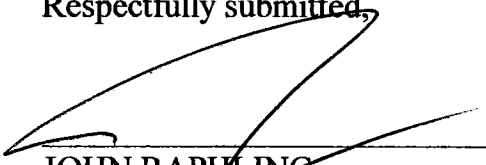
By taking judicial notice of the scientific treatises about MDMA, the Court of Appeal has exceeded its authority and, in so doing, relieved the prosecution of its burden to prove all elements of the charged offenses and denied appellant of a fair trial. The Court of Appeal's expansion of the concept of judicial notice will affect far more circumstances than the limited issue in this case. For that reason, this Court should grant review to settle this important question of law.

CONCLUSION

For the foregoing reasons, appellant urges this Court to grant review his case.

Dated: December 1, 2011

Respectfully submitted,

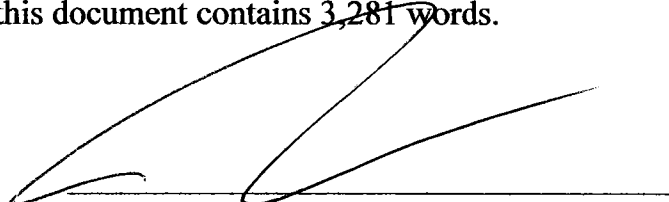


JOHN RAPHLING,
Attorney for Appellant

WORD COUNT CERTIFICATION

People v. Zachary Davis

I certify that this document was prepared on a computer using Corel Wordperfect,
and that, according to that program, this document contains 3,281 words.



JOHN RAPHLING

PROOF OF SERVICE

Re: People v. Zachary Davis, B229615 (Superior Court No. BA367204)

I am a resident of the aforesaid county, State of California; I am over the age of 18 years and not a party to the within action; my business address is 723 Ocean Front Walk, Venice, California 90291.

On December 2, 2011, I served the foregoing documents described as:

PETITION FOR REVIEW

on all interested parties in this action. By placing the ___ original or X true copy thereof enclosed in a sealed envelope addressed as follows:

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 X [BY MAIL] I caused such envelope to be deposited in the mail at Venice, California. The envelope was mailed with postage thereof fully prepaid.

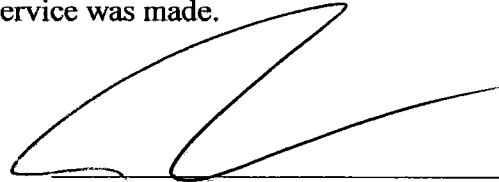
 [BY PERSONAL SERVICE] I caused such envelope to be delivered by hand to the offices of the addressee(s).

 [FEDERAL EXPRESS] I caused such envelope to be delivered via Federal Express at Venice, California.

 [BY FAX] I transmitted the above document to the above facsimile.

 X [STATE] I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

 [FEDERAL] I declare that I am employed in the office of a member of the bar of this court at whose direction the service was made.



John Raphling

EXHIBIT A

CERTIFIED FOR PUBLICATION

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

SECOND APPELLATE DISTRICT

DIVISION FOUR

THE PEOPLE,

Plaintiff and Respondent,

v.

ZACHARY EDWARD DAVIS,

Defendant and Appellant.

B229615

(Los Angeles County
Super. Ct. No. BA367204)

COURT OF APPEAL - SECOND DIST.

FILED

OCT 26 2011

JOSEPH A. LAINE

Clerk

Deputy Clerk

APPEAL from a judgment of the Superior Court of Los Angeles County, Barbara R. Johnson, Judge. Affirmed.

John Raphling, under appointment by the Court of Appeal, for Defendant and Appellant.

Kamala D. Harris, Attorney General, Dane R. Gillette, Chief Assistant Attorney General, Pamela C. Hamanaka, Assistant Attorney General, Scott A. Taryle and Stacy S. Schwartz, Deputy Attorneys General, for Plaintiff and Respondent.

Appellant Zachary Edward Davis appeals his conviction for sale of a controlled substance and possession of a controlled substance. He argues there is insufficient evidence to support the jury's guilty verdict, and that the instructions provided to the jurors removed an element of the offense from their determination. We conclude there is sufficient evidence to support the conviction. We also conclude that, to the extent there was instructional error, that error was harmless. Accordingly, we affirm the judgment.

FACTUAL AND PROCEDURAL SUMMARY

On December 31, 2009, members of the Los Angeles Police Department (LAPD) Gang Narcotics Division Buy Team conducted an undercover operation at a rave party held at the Los Angeles Coliseum. One of the undercover officers, Romeo Rubalcava, attempted to purchase from appellant the drug methylenedioxymethamphetamine (MDMA), commonly known as Ecstasy. After their initial encounter, Officer Rubalcava saw appellant walk to meet with another individual, Jeffrey Kiralla. After a brief meeting, appellant then returned to Officer Rubalcava and handed him two blue pills from a plastic container. Officer Rubalcava gave appellant \$20 in exchange.

Appellant was arrested. Kiralla also was arrested, and as officers approached him, he dropped a plastic bag containing 19 blue pills. The LAPD crime lab tested the two pills sold by appellant to Officer Rubalcava and a representative sample of the 19 pills recovered. The tests showed the pills contained MDMA. Appellant was charged with sale of a controlled substance (Health & Saf. Code, § 11379, subd. (a)),¹ in count 1; and possession for sale of a controlled substance (§ 11378), in count 2. He pleaded not guilty.

At trial, Wubayehu Tsega, a criminalist from the LAPD crime lab, testified that the pills tested positive for MDMA. Officer Rubalcava testified about the sale of the pills. He also testified that MDMA is a "raiser drug" and a "party drug," the effects of which can last up to 24 hours. The defense called no witnesses.

¹ All further statutory references are to the Health and Safety Code unless otherwise indicated.

The jury found appellant guilty as charged on count 1, and guilty of the lesser included offense of possession of a controlled substance (§ 11377) on count 2. The court sentenced appellant on count 1 to 36 months formal probation with the condition that he serve 90 days in county jail. The sentence on count 2 was stayed pursuant to Penal Code section 654, subdivision (a). This appeal followed.

DISCUSSION

I

Appellant contends there is insufficient evidence to support the conviction. In reviewing the sufficiency of evidence to support a conviction, we review the entire record in the light most favorable to the judgment to determine whether it discloses substantial evidence, such that a reasonable trier of fact could find the essential elements of the crime beyond a reasonable doubt. (*People v. Ochoa* (1993) 6 Cal.4th 1199, 1206.) Substantial evidence is evidence that is reasonable, credible, and of solid value. (*People v. Mendez* (2010) 188 Cal.App.4th 47, 56.)

Sections 11377 and 11379 prohibit the possession of “any controlled substance” specified in several statutes, including sections 11054 and 11055. MDMA is not listed explicitly as a controlled substance in any of these statutes.² However, section 11055, subdivision (d)(1) identifies “[a]mphetamine, its salts, optical isomers, and salts of its optical isomers.” Section 11055, subdivision (d)(2) lists “[m]ethamphetamine, its salts, isomers, and salts of its isomers” as a controlled substance. More broadly, subdivision (d) of section 11055 provides that “any material, compound, mixture, or preparation” containing “any quantity” of several substances having a “stimulant effect on the central nervous system,” including amphetamine and methamphetamine, is a controlled substance.

Section 11054, subdivision (d)(6) identifies “methylenedioxy amphetamine” (MDA) as a controlled substance, and subdivision (d) of section 11054 includes “any

² MDMA is listed as a controlled substance under federal law. (51 Fed.Reg. 36552 (Oct. 14, 1986).)

material, compound, mixture, or preparation” containing “any quantity” or any “salts, isomers, and salts of isomers” of any listed hallucinogenic substance, including MDA.

An analog of a listed controlled substance is treated the same as the listed controlled substance. (§ 11401, subd. (a).) A “controlled substance analog” is defined as a substance that: (1) has a substantially similar chemical structure as the controlled substance, or (2) has, is represented as having, or is intended to have a substantially similar or greater stimulant, depressant, or hallucinogenic effect as the controlled substance. (§ 11401, subd. (b).)

In sum, MDMA may be treated as a controlled substance in one of two ways: (1) by containing any quantity of amphetamine, methamphetamine, or MDA; or (2) by meeting the definition of a controlled substance analog.

Appellant argues that because MDMA is not a named controlled substance, the prosecution was required to introduce expert testimony expressly comparing MDMA’s chemical structure and physiological effects to that of a specifically named controlled substance. Because the prosecution did not introduce such testimony, appellant asserts, there was insufficient evidence for the jury to find that the MDMA appellant sold to the undercover officer was an unlawful controlled substance.

Appellant cites two decisions for the proposition that only expert testimony expressly comparing MDMA to another controlled substance is sufficient to sustain a conviction for possession or sale of MDMA. In *People v. Becker* (2010) 183 Cal.App.4th 1151 (*Becker*), the defendant was convicted of possessing MDMA in violation of section 11377. He argued the prosecution failed to introduce substantial evidence that MDMA is a controlled substance. (*Id.* at p. 1155.) At trial, an investigator testified that Ecstasy, which is MDMA, includes methamphetamine, and thus has a stimulant effect substantially similar to the stimulant effect of methamphetamine. (*Id.* at p. 1156.) The court rejected the defendant’s argument, holding that on the basis of the investigator’s testimony, the jury reasonably could have concluded that MDMA was a controlled substance itself or a controlled substance analog of methamphetamine. (*Ibid.*) Thus, the court determined that substantial evidence supported the defendant’s conviction.

Similarly, in *People v. Silver* (1991) 230 Cal.App.3d 389, 392 (*Silver*), the defendant was convicted by a jury of possession for sale and sale of MDMA in violation of sections 11378 and 11379. At trial the parties presented competing expert testimony as to whether MDMA is an analog of methamphetamine. (*Id.* at pp. 392-393.) The experts compared the molecular structure and physiological effect of the two drugs. (*Id.* at pp. 392-393, 396.) The court concluded that this testimony provided sufficient evidence to support the jury's guilty verdict. (*Id.* at p. 396.)

Appellant is thus correct that both *Becker* and *Silver* held that testimony expressly comparing MDMA to an enumerated controlled substance was sufficient evidence to support a jury conviction. However, neither decision suggests that such testimony is necessary to uphold a jury's guilty verdict on appeal.

After the conclusion of briefing in this case, Division Two of this district decided *People v. Le* (2011) 198 Cal.App.4th 1031 (*Le*). During trial, the prosecutor and defense counsel stipulated that pills confiscated from the defendant contained MDMA; however the parties did not stipulate that MDMA was a controlled substance. (*Id.* at pp. 1034-1035.) The court addressed whether the stipulation alone was sufficient evidence to support the defendant's conviction for transportation for sale and possession for sale of a controlled substance. (*Id.* at p. 1033.) The court held that it was not. (*Id.* at p. 1038.) Rather, the court noted "there is no doctrine that permits a trial court (or the trier of fact) to conclude that 3, 4-methylenedioxyamphetamine contains amphetamine merely because their names are similar." (*Id.* at p. 1037.) Overturning the defendant's conviction, the court concluded "[i]n the absence of a stipulation [that MDMA is a controlled substance], the prosecution must offer an expert who testifies that the language of a controlled substance statute or the analog statute has been satisfied." (*Id.* at pp. 1037-1038.)

If we were to follow *Le*, we would have to overturn appellant's conviction, because there was neither a stipulation nor expert testimony showing that MDMA meets the definition of a controlled substance or controlled substance analog. The evidence offered by the prosecution on this issue was MDMA's chemical name, which contains the

terms amphetamine and methamphetamine. Criminalist Tsega testified that the pills recovered from appellant contained MDMA or Ecstasy. The prosecution thus presented evidence that the pills appellant sold to Officer Rubalcava contained MDMA, and evidence adduced at trial showed that MDMA is the abbreviation for methylenedioxyamphetamine. MDMA's formal name contains both methamphetamine and amphetamine, drugs that are enumerated controlled substances. Its name also is similar to "methylenedioxy amphetamine," or MDA, which is a listed controlled substance under the statute.³ We apply common sense in concluding that the chemical name of the substance, by including the term "methamphetamine" and not including any suffix or term negating the inference (e.g., "pseudo"), supports the inference that the pills appellant sold to Officer Rubalcava contained methamphetamine. We accordingly decline to follow *Le*.

We also take judicial notice of "[f]acts and propositions that are not reasonably subject to dispute and are capable of immediate and accurate determination by resort to sources of reasonably indisputable accuracy," bearing on the issue. (Evid. Code, § 452, subd. (h).)⁴ "These include, for example, facts which are widely accepted as established by experts and specialists in the natural, physical, and social sciences which can be verified by reference to treatises, encyclopedias, almanacs and the like or by persons learned in the subject matter." (*Gould v. Maryland Sound Industries, Inc.* (1995) 31 Cal.App.4th 1137, 1145.)

³ Before it was listed as a controlled substance under federal law, MDMA was treated as an analog of MDA. (*United States v. Carlson* (11th Cir. 1996) 87 F.3d 440, 445; *United States v. Raymer* (10th Cir. 1991) 941 F.2d 1031, 1045-1046; *United States v. Desurra* (5th Cir. 1989) 865 F.2d 651, 652.) Indeed, the development of MDMA as an unregulated alternative to MDA, a controlled substance, prompted Congress to regulate controlled substance analogs. (*Id.* at p. 653, citing S.Rep. No. 99-196, 99th Cong., 1st Sess. 2 (1985); H.R.Rep. No. 99-848, 99th Cong., 2d Sess. 4 (1986).)

⁴ In a letter sent to the parties, we informed them that we were considering the propriety of taking judicial notice, and afforded them an opportunity to respond.

Reference to learned treatises verifies that MDMA's chemical name reflects its component elements, which include methamphetamine and, by extension, amphetamine. The scientific names of chemical compounds reflect their composition. (Zumdahl, Chemical Principles (2d ed. 1995) p. 39.) Both methamphetamine and MDMA are derivatives of amphetamine. (Baer & Holstege, Encyclopedia of Toxicology (2d ed. 2005) p. 96.) In chemistry, a derivative is a compound that may be produced from another compound in one or more steps. (Stedman's Medical Dictionary (28th ed. 2006) p. 516). Methamphetamine's scientific name, consisting of meth and amphetamine, confirms that it is "[a] methyl derivative of amphetamine."⁵ (Oxford English Dict. Online (3d ed. 2001) <<http://www.oed.com>> [as of Oct. 05, 2011].) Similarly, MDMA's name demonstrates that it is produced from methamphetamine by the addition of methylenedioxy. The scientific name of MDMA thus accurately reflects that it is derived from methamphetamine and amphetamine. (See also Stedman's Medical Dictionary, *supra*, at p. 1164.)

Based on the foregoing and the absence of any evidence or logic to the contrary, we conclude it may be inferred that MDMA contains some quantity of methamphetamine or amphetamine under section 11055, subdivision (d). We therefore hold that the evidence is sufficient to establish that the pills appellant sold to Officer Rubalcava contained a controlled substance under state law.

II

Appellant also argues that MDMA's status as a controlled substance or controlled substance analog is an element of the offenses of which he was convicted, and that the jury should have been instructed, *sua sponte*, to determine the issue as one of fact.⁶

⁵ Meth represents methyl in compound words. (Stedman's Medical Dictionary, *supra*, at p. 1196.)

⁶ Respondent argues that appellant forfeited his claim of instructional error because he did not object to the provided instructions. But, "[i]nstructions regarding the elements of the crime affect the substantial rights of the defendant, thus requiring no objection for

We determine whether a jury instruction correctly states the law under the independent or de novo standard of review. (*People v. Ramos* (2008) 163 Cal.App.4th 1082.) Instructional error relieving the prosecution of the burden of proving beyond a reasonable doubt each element of the charged offense violates the defendant's rights under both the United States and California Constitutions. (*People v. Flood* (1998) 18 Cal.4th 470, 479-480 (*Flood*)). In reviewing the instructions, we look to "whether the trial court 'fully and fairly instructed on the applicable law.' [Citation.]" (*People v. Ramos, supra*, 163 Cal.App.4th at p. 1088.)

The court instructed the jury as follows: "The defendant is charged with selling methylenedioxyamphetamine, commonly called Ecstasy, a controlled substance. . . . To prove that the defendant is guilty of this crime, the People must prove that: 1. The defendant sold a controlled substance; 2. The defendant knew of its presence; 3. The defendant knew of the substance's nature or character as a controlled substance; and 4. The controlled substance was methylenedioxyamphetamine, commonly called Ecstasy. . . . The People do not need to prove that the defendant knew which specific controlled substance he sold, only that he was aware of the substance's presence and that it was a controlled substance." The court provided a similar instruction for the possession charge.

In *Silver*, the defendant was convicted of possessing MDMA for sale. On appeal, the court rejected Silver's claim that the jury was confused, noting that the trial court instructed that "It will be your function to determine whether M.D.M.A. is an analog of methamphetamine because a controlled substance analog is regarded the same as the controlled substance of which it is an analog. [¶] . . . [¶] The burden is on the prosecution to prove beyond a reasonable doubt that M.D.M.A. is an analog of

appellate review." (*People v. Hillhouse* (2002) 27 Cal.4th 469, 503; see also Pen. Code, § 1259.) Appellant claims that the issue whether MDMA is a controlled substance or a controlled substance analog is an element of the offense and a question of fact to be determined by the jury. This claim is one affecting his substantial rights. Thus, appellant's failure to object to the instruction at trial did not forfeit his right to appellate review.

methamphetamine. If you have a reasonable doubt whether M.D.M.A. is an analog of methamphetamine, you must give the defendant the benefit of that doubt and find him not guilty.” (*Silver, supra*, 230 Cal.App.3d at p. 397.) The court concluded the jury was properly instructed that it was its function to determine whether MDMA is an analog of methamphetamine. (*Id.* at pp. 397-398.)

Here, the trial court did not instruct the jury that in order to find appellant guilty of possessing or selling MDMA it had to determine that MDMA is a controlled substance or a controlled substance analog. Because there was a reasonable inference that the MDMA pills were a controlled substance and no evidence to the contrary was presented, arguably it was proper for the trial court to presume the truth of the fact in the instruction. Nonetheless, we believe the better view is that the jury should have been instructed on the point since we find MDMA’s status as a controlled substance to be an inference rather than a presumption.⁷ Had an instruction been provided, it would have been appropriate to tell the jury that it was logical to infer that MDMA was a controlled substance. Given that there was no instruction, we will assume for the purposes of this appeal that the failure to do so was in error.

On appeal, we apply harmless error analysis when reviewing a trial court’s instruction that removed an element of the offense from jury consideration. (*Flood, supra*, 18 Cal.4th at pp. 502-503.) “Error is harmless ‘where an omitted element is supported by uncontroverted evidence,’ as ‘where a defendant did not, and apparently could not, bring forth facts contesting the omitted element.’” (*People v. Stanfill* (1999) 76 Cal.App.4th 1137, 1154, quoting *Neder v. United States* (1999) 527 U.S. 1, 18.) Stated another way, when the defendant effectively concedes or admits the omitted element, such error is harmless. (*Flood, supra*, 18 Cal.4th at p. 504.)

⁷ “An inference is a deduction of fact that may logically and reasonably be drawn from another fact or group of facts found or otherwise established in the action.” (Evid. Code, § 600, subd. (b).) “A presumption is an assumption of fact that the law requires to be made from another fact or group of facts found or otherwise established in the action.” (Evid. Code, § 600, subd. (a).)

In *Flood, supra*, 18 Cal.4th at pages 475, 477, the trial court removed an element of an offense from the jury's consideration, not by failing to instruct on it, but by telling the jury that it was a given and not a fact for the jury to determine. Although the Supreme Court stated that this instruction violated the defendant's due process rights to have the jury determine each element of the offense, it ultimately decided the error was harmless because the defendant effectively conceded the element. (*Id.* at pp. 504-505.) Such concessions include the failure to request mention of the element in the jury instruction, to refer to this element during trial, to argue to the jury that the prosecution had failed to prove the element beyond a reasonable doubt, to present evidence on the issue, and to dispute the prosecution's evidence on the issue. (*Id.* at p. 505.) "[I]ndeed, he did not ask that the issue even be considered by the jury." (*Ibid.*) The court acknowledged that a defendant's tactical decision not to "contest" an essential element of an offense did not forgo the requirement that the jury consider whether the prosecution had proved every element of the crime. (*Ibid.*) But, the court reasoned that because the defendant's actions were tantamount to a concession on the disputed element, any error in the jury instructions did not contribute to the jury's guilty verdict and thus was harmless. (*Ibid.*)

Here, as in *Flood*, appellant effectively conceded the issue of whether MDMA constitutes a controlled substance or controlled substance analog that he now claims was erroneously excluded from jury consideration. Appellant failed to request that the element be included in the jury instruction and did not object to instructions provided without the element. Appellant also did not argue to the jury that the prosecution had failed to carry its burden in proving the element. At trial, appellant did not dispute that MDMA was a controlled substance. In their summations, both attorneys argued their case as if it were a given fact that MDMA was a controlled substance. Defense counsel often referred to Ecstasy as a "drug" and a "narcotic." The record thus establishes that appellant effectively conceded that MDMA constitutes a controlled substance.

On this record, it is not reasonably probable the verdict would have been different had the jury been properly instructed. "The United States Supreme Court has

admonished that, '[h]armless-error analysis addresses . . . what is to be done about a trial error that, in theory, may have altered the basis on which the jury decided the case, but in practice clearly had no effect on the outcome.' [Citation.]" (*People v. Harris* (1994) 9 Cal.4th 407, 431, italics omitted.) We are satisfied beyond a reasonable doubt that the instructional error here played no part in the jury's verdict.

DISPOSITION

The judgment is affirmed.

CERTIFIED FOR PUBLICATION.

EPSTEIN, P. J.

We concur:

WILLHITE, J.

MANELLA, J.

EXHIBIT B



JOSEPH A. LANE
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DANIEL P. POTTER
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Court of Appeal

STATE OF CALIFORNIA
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August 31, 2011

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Re: People v. Davis, Case No. B229615

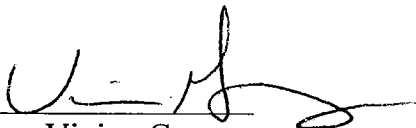
Dear Counsel:

This is to notify you that, pursuant to Evidence Code section 452, subdivision (h), the court is considering taking judicial notice of the following treatises: Baer & Holstege, 3 Encyclopedia of Toxicology (Wexler edit., 2nd ed. 2005); Stedman's Medical Dictionary (28th ed. 2006); and Zumdahl, Chemical Principles (2nd ed. 1995). A copy of the relevant sections from each source is attached to this letter, in addition to the source's cover page. Zumdahl's Chemical Principles discusses the system for naming chemical compounds. The other sources provide information about methylenedioxymethamphetamine.

Pursuant to Evidence Code section 455, you are invited to present information relevant to (1) the propriety of taking judicial notice of the matters and (2) the tenor of the matters to be noticed.

Please file any response by September 8, 2011.

Very truly yours,


By: Vivian Guzman
Deputy Clerk

Enclosures



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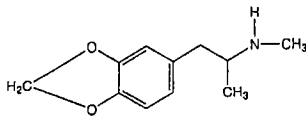
SEP 26 2005

Methylenedioxyamphetamine

Alexander B Baer and Christopher P Holstege

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- CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER: CAS 69610-10-2
- SYNONYMS: 3,4-Methylenedioxyamphetamine; Adam; Bean Doctor; E; Ecstasy; Essence; MDM; MDMA; M & Ms; Roll; The Substance; X; XTC
- CHEMICAL/PHARMACEUTICAL/OTHER CLASS: Synthetic phenylalkylamine derivative of amphetamine
- CHEMICAL STRUCTURE:



Uses

Formerly a psychotherapeutic agent, methylenedioxyamphetamine (MDMA) is now abused as a hallucinogenic amphetamine.

Exposure Routes and Pathways

MDMA is available illicitly in tablet, capsule, and powder forms. It is most commonly ingested, but insufflation and intravenous injection has also been reported.

Toxicokinetics

MDMA is rapidly absorbed with the onset of effects occurring in 20–60 min. Concentrations peak at 2–3 h and typically last 4–6 h. Prolonged effects lasting up to 48 h may be seen following large doses. MDMA is metabolized in the liver by cytochrome P450, chiefly CYP2D6, to form methylenedioxyamphetamine (MDA). The volume of distribution is considered large (> 5 l kg⁻¹). MDMA and its metabolites are excreted renally, with 75% as unchanged MDMA and 7% as MDA. Elimination is usually complete within 24 h.

Mechanism of Toxicity

MDMA induces norepinephrine release from presynaptic vesicles. MDMA also effects serotonin neurotransmission by causing release of serotonin

(5-hydroxytryptamine (5-HT)) and inhibiting its uptake. In animal models, it has been demonstrated to cause long-term destruction of 5-HT axons. Studies demonstrate lowered concentrations of the 5-HT metabolite 5-hydroxyindoleacetic acid in the cerebrospinal fluid of regular MDMA users. This correlates with a similar decrease reported in primates with brain damage induced by MDMA.

Acute and Short-Term Toxicity (or Exposure)

Animal

In animals, a toxic dose is estimated to be 10–30 mg kg⁻¹. Reported effects in small animals include hyperthermia, rapid respirations, rapid heart-beat, dilated pupils, lactic acidosis, hypertension, arrhythmias, vomiting, and diarrhea. Renal failure, seizures, and coma are possible.

Human

Symptoms noted in acute toxicity include anxiety, mydriasis, hypertension, tachycardia, tachypnea, hallucinations, bruxism, and diaphoresis. Hyperthermia, arrhythmias, hyperreflexia, seizures, metabolic acidosis, ischemia, rhabdomyolysis, and renal failure may be seen in severe toxicity. Hyponatremia, hyperkalemia, coagulopathies, pulmonary edema, and adult respiratory distress syndrome have also been reported. MDMA may cause liver injury. While the vast majority of these cases have spontaneous recovery, an increasing number of fulminant hepatic failure reports are now appearing in the literature. Hyponatremia is a recognized complication that is thought to have several contributing factors including sodium loss through excessive sweating, hemodilution with large free water volume intake, and inappropriate secretion of antidiuretic hormone leading to water retention. Sudden death is likely due to cardiac arrhythmias, seizures, and central nervous system depression. Blood levels do not correlate with toxicity but can confirm exposure.

Chronic Toxicity (or Exposure)

Animal

Several models of MDMA exposure in animals have described long-term adverse effects on emotion. These effects have responded to treatment with serotonergic agents such as fluoxetine.

Human

Positron Emission Tomography (PET) scans of former abusers of MDMA have revealed a decrease

in the brain serotonergic neurons. These changes are of unknown consequences but may include depression, anxiety, and memory impairment. Chronic paranoid psychosis, depression, flashbacks, panic disorders, and some impairment of cognitive function have been related to long-term use.

In Vitro Toxicity Data

Several studies have demonstrated that MDMA can suppress neutrophil phagocytosis as well as suppress the production of tumor necrosis factor-alpha and interleukin.

Clinical Management

There is no antidote for MDMA poisoning. General supportive care is the mainstay of therapy. Activated charcoal may be used to adsorb the MDMA within an hour of ingestion. Benzodiazepines may be a useful adjunct for the immediate management of an acutely agitated or psychotic patient that poses an immediate threat to healthcare staff or self.

Hypertensive emergencies with end-organ ischemia may be treated with antihypertensive agents such as nitroprusside. Beta-blocking agents should be used with caution due to concern of causing unopposed alpha agonism leading to worsening end-organ ischemia. Phentolamine may be useful in cases of hypertensive emergencies or end-organ ischemia refractory to nitrate infusions.

Hypothermic blankets, ice water baths, chilled intravenous fluids, gastric and bladder lavage with cooled fluids may be needed to reduce body temperature. Dantrolene has also been utilized for the treatment of MDMA-related hyperthermia. Measuring creatinine phosphokinase and urine myoglobin levels can be helpful in recognizing those at risk of developing acute renal failure due to rhabdomyolysis. Ensuring adequate urine output with intravenous fluids is the mainstay of treatment for preventing acute tubular necrosis.

See also: Drugs of Abuse.

Further Reading

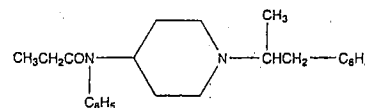
- Dowling GP, McDonough ET, and Bost RO (1987) 'Eve' and 'Ecstasy'. A report of five deaths associated with the use of MDEA and MDMA. *Journal of the American Medical Association* 257: 1615–1617.
- Henry JA, Jeffreys KJ, and Dawling S (1992) Toxicity and deaths from 3,4-methylenedioxyamphetamine ('ecstasy'). *Lancet* 340: 384–387.
- McCann UD, Slate SO, and Ricaurte GA (1996) Adverse reactions with 3,4-methylenedioxyamphetamine (MDMA; 'ecstasy'). *Drug Safety* 15: 107–115.
- Milroy CM (1999) Ten years of 'ecstasy'. *Journal of the Royal Society of Medicine* 92: 68–72.
- Shannon M (2000) Methylenedioxyamphetamine (MDMA, 'Ecstasy'). *Pediatric Emergency Care* 16: 377–380.

Methylfentanyl, α-

Abraham Dalu

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- CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER: CAS 79704-88-4
- SYNONYMS: N-[1-(1-Methyl-2-phenylethyl)-4-piperidyl]-N-phenylpropanamide; China white
- CHEMICAL/PHARMACEUTICAL/OTHER CLASS: α-Methylfentanyl is a narcotic analgesic, a designer drug derived from fentanyl
- CHEMICAL FORMULA: C₂₃H₃₀N₂O
- CHEMICAL STRUCTURE:

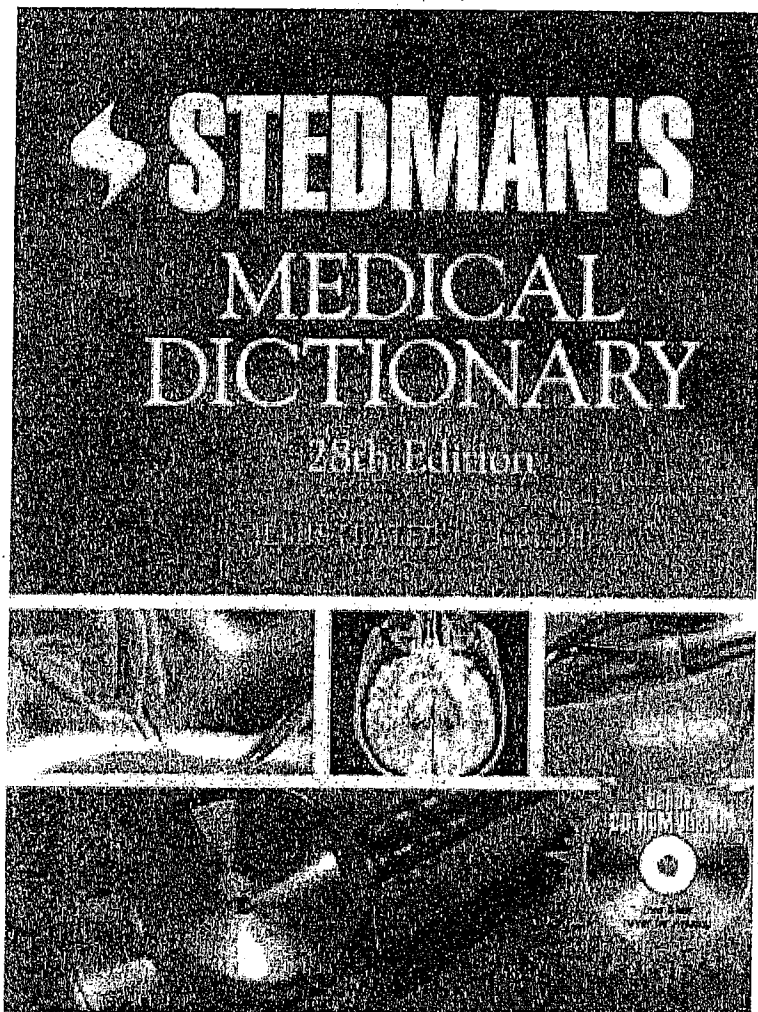


Uses

α-Methylfentanyl is not medically used per se, although it is a derivative of fentanyl with higher analgesic effects. α-Methylfentanyl is a designer drug that has been synthesized for its analgesic and euphoric effects. Due to its high potency (1000–2000 times more potent than heroin) and fast-acting narcotic analgesia, it has high abuse potential and is sold on the street as synthetic heroin. α-Methylfentanyl also has a high abuse potential in racing horses for its analgesic and stimulant actions. Therefore, α-methylfentanyl is a controlled substance listed in the US Code of Federal Regulations, Title 21, Part 1308.11 (1987).

Exposure Routes and Pathways

Most common exposure pathways to α-methylfentanyl are via intramuscular or intravenous injection.



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- ma·za·mor·ra** (ma'zā-mōr'ā). Name given in Puerto Rico to a dermatitis caused by penetration of the skin by hookworm larvae.
- maze** (māz). A labyrinth; frequently used to study higher functions of the nervous system in rats. [M.E. *masen*, to confuse]
- mazo-** (mā'zō). Do not confuse words containing this combining form with words formed from Greek *maza* 'placenta'. The breast. SEE ALSO *masto-*. [G. *mazos*]
- Maz·zo·ni** (mahts-tsō'nē), Vittorio, Italian physician, 1880–1940. SEE *Mazzoni corpuscle*; *Golgi-M. corpuscle*.
- Maz·zot·ti** (mā-zōt'ē), Luigi, Mexican physician specializing in tropic medicine in mid-20th-century. SEE *Mazzotti reaction*, *Mazzotti test*.
- Mb, MbCO, MbO₂** myoglobin and its combinations with CO and O₂ (oxymyoglobin), respectively.
- MBC** Abbreviation for maximum breathing capacity.
- MBL** Abbreviation for mannan-binding lectin.
- MBP**. Abbreviation for major basic protein.
- M.C.** Abbreviation for *Magister Chirurgiae*, Master of Surgery; Medical Corps.
- mc** Former abbreviation for millicurie.
- mcΩ** Symbol for microhm.
- MCAD** Abbreviation for medium-chain acyl-CoA dehydrogenase.
- Mc·Ar·dle** (mīk-kar'dēl), Brian, 20th-century British neurologist. SEE *McArdle disease*; *McA.-Schmid-Pearson disease*; *McArdle syndrome*.
- Mc·Bur·ney** (mīk-būr'nē), Charles, U.S. surgeon, 1845–1913. SEE *McBurney incision*; *McBurney point*; *McBurney sign*.
- mcC** Symbol for microcoulomb.
- Mc·Call** (mīk-kahl'), M.L., 20th-century U.S. gynecologist. SEE *McCall culdoplasty procedure*.
- Mc·Car·thy** (mīk-kar'thē), Daniel J., U.S. neurologist, 1874–1958. SEE *McCarthy reflexes*, under *reflex*.
- mcCi** Symbol for microcurie.
- Mc·Crea** (mīk-kreā'), Lowrain E., 20th-century U.S. urologist. SEE *McCrea sound*.
- Mc·Cune** (mīk-kyūn'), Donovan James, U.S. pediatrician, 1902–1976. SEE *M.-Albright syndrome*.
- Mc·Don·ald** (mīk-don'ald), Ellice, U.S. gynecologist, 1876–1955. SEE *McDonald maneuver*.
- mcg** Symbol for microgram.
- Mc·Goon** (mīk-gūn'), Dwight C., 29th-century U.S. surgeon. SEE *McGoon technique*.
- MCH** Abbreviation for mean corpuscular hemoglobin.
- M.Ch.** Abbreviation for *Magister Chirurgiae*, Master of Surgery.
- MCHC** Abbreviation for mean corpuscular hemoglobin concentration.
- MCI** Acronym for multicasualty incident.
- mcCi** Abbreviation for millicurie.
- Mc·Kee** (mīk-kē'), George Kenneth, 20th-century British orthopedic surgeon. SEE *McKee line*.
- Mc·Kus·ick** (mīk-kū'sīk), Victor Almon, 20th-century U.S. physician. SEE *McKusick metaphysial dysplasia*.
- MCL** Abbreviation for midclavicular line.
- mcl, mL** Symbol for microliter.
- Mc·Lean** (mīk-lēn'), Malcolm, U.S. obstetrician, 1848–1924. SEE *Tucker-McLean forceps*.
- mcm** Symbol for micrometer.
- MCMI** Abbreviation for Millon Clinical Multiaxial Inventory.
- mcmol** Symbol for micromole.
- mcmol/L** Symbol for micromolar.
- Mc·Mur·ray** (mīk-mūr'ē), Thomas P., British surgeon, 1887–1949. SEE *McMurray test*.
- m-cone** (kōn). Middle wavelength sensitive cone (green cone).
- MCP** Abbreviation for metacarpophalangeal.
- MCP-1** Abbreviation for monocyte chemoattractant protein-1.
- Mc·Phail** (mīk-fāl'), M.K., 20th-century Canadian physiologist. SEE *McP. test*.
- MCR** Abbreviation for steroid metabolic clearance rate.
- M-CSF** Abbreviation for macrophage colony-stimulating factor.
- MCV** Abbreviation for mean corpuscular volume.
- mcV** Symbol for microvolt.
- Mc·Vay** (mīk-vā'), Chester B., 20th-century U.S. surgeon. *McV. operation*.
- MD** Abbreviation for [L.] *Medicinae Doctor* (Doctor of Medicine); methylchloroarsine; malate dehydrogenase.
- Md** Symbol for mendelevium.
- MDF** Abbreviation for myocardial depressant factor.
- MDI** Abbreviation for metered-dose inhaler.
- m. dict.** Abbreviation for [L.] *more dicto*, as directed.
- MDMA** A centrally active phenethylamine derivative related to amphetamine and methamphetamine, with central nervous system excitant and hallucinogenic properties. Synonym: methylenedioxymethamphetamine.
- MDMA was first synthesized in Germany early in the 20th century and patented for use as an appetite suppressant, but because of its unacceptably high incidence of severe side effects it was never marketed for that indication. During the 1960s and 1970s, it was used experimentally as an adjunct to psychotherapy. Administration has never been legal in the U.S., except as a Schedule I investigational drug. At present no medical indications for its use are recognized. Since the late 1980s, it has been an increasingly popular drug of abuse among white middle-class adolescents and young adults in metropolitan and suburban communities. More than a million tablets are smuggled into the U.S. each year from Belgium, Israel, and the Netherlands. It is also produced in illicit laboratories in this country. Known as "ecstasy" and by a number of other street synonyms (E, XTC, M&M, ADAM, Clarity, Lover's Speed, Blue Drug, Bean, Roll), it is usually dispensed as compressed tablets bearing various logos, particularly butterfly, lightning bolts, and four-leaf clovers. Tablets vary in concentration and purity and may contain substances other than MDMA, including caffeine, dextromethorphan, as adulterants or substitutes. MDMA is a club drug, that is, an agent sold and ingested at night dance parties ("raves," "techno parties," "trance") where most or all participants use the drug and where decor, entertainment, and ambiance are intended to enhance its psychotropic effects. Pharmacologically, MDMA acts as a monoaminergic agonist, promoting a copious serotonin release in midbrain centers. Taken orally a dose of 100 mg induces euphoria, loquacity, a sense of increased energy and heightened social intimacy lasting 4–6 hours. Some users experience perceptual distortion and hallucinations, delirium, anxiety, panic attacks, aggressiveness, paranoia, and seizures. Physiologic effects include elevation of pulse and blood pressure, hyperthermia, dehydration, and muscular twitching and spasms (particularly jaw clenching) sometimes resulting in rhabdomyolysis. Excessive water consumption can lead to water intoxication. After the acute effects wear off, the user may experience depression, flashbacks, or amnesia. Some of these effects can persist or recur for weeks after use is discontinued. MDMA is frequently used in combination with other drugs, especially marijuana. Serially repeated dosing ("piggy-backing") increases the risk of psychosis, life-threatening cardiovascular emergencies, and malignant hyperthermia. Use of MDMA accounts for 5000–6000 emergency department visits yearly. Human and animal studies have documented a neurotoxic effect of MDMA on serotonin pathways. A single dose of MDMA has been shown to cause selective neurotoxicity. Repetitive use has been shown to cause selective

permanent brain damage manifested by irreversible cognitive impairment and memory loss.

MDMCF Abbreviation for monocyte-derived neutrophil chemotactic factor.

Dowel (mik-dow'el), Benjamin G., Irish anatomist, 1829-1887. SEE *frenulum* of M.

MDR Abbreviation for multidrug resistance.

M.D.S. Abbreviation of Master of Dental Surgery.

M Abbreviation for medical examiner.

M Symbol for methyl.

Meckel's OWLS (med'ōz), William Robert, 20th-century U.S. cardiologist. SEE *M. syndrome*.

Meal (mēl). 1. The food consumed at regular intervals or at a specified time. 2. Ground flour from a grain.

Mealyden m. (boy'dēn), a m. consisting of three or four egg yolks, beaten up in milk and seasoned with sugar, port wine, and other ingredients, used to test the evacuation time of the gallbladder; portions to three quarters of the contents will be normally evacuated within 40 minutes.

Mealyden m., a meal of skimmed milk powder mixed with corn oil and dextrose used to assess pancreatic function.

Meat m. (1) toast and tea, or crackers and tea, or gruel or other solid food, given to stimulate gastric secretion before withdrawing gastric contents for analysis; (2) administration of food containing a substance thought to be responsible for symptoms, such as an allergic reaction.

Mean (mēn). A statistical measurement of central tendency or average of a set of values, usually assumed to be the arithmetic mean, unless otherwise specified. [M.E., *mene* fr. O.Fr., fr. L. *medianus*, in the middle]

Arithmetic m., the m. calculated by adding a set of values and dividing the sum by the number of values.

Geometric m., the m. calculated as the antilogarithm of the arithmetic mean of the logarithms of the individual values; it can also be calculated as the *n*th root of the product of *n* values.

Harmonic m., the m. calculated as the number of values being added, divided by the sum of their reciprocals.

Median of the m., (1) if, for a symmetric population with a single mode, a measurement, selected because it is extreme, is obtained, on average the second reading will be closer to the m. than the first. (2) in psychiatry, the tendency for children of emotional parents to have characteristics of the general population.

Standard error of the m. (SEM), a statistical index of the probability that a given sample m. is representative of the m. of the population from which the sample was drawn.

Measle (mē'zēl). 1. The larva (*Cysticercus cellulosae*) of *Taenia solium*, the pork tapeworm; *C. cellulosae* is less frequently used to designate cysticerci of *T. solium*. 2. The larva (*Cysticercus bovis*) of *Taenia saginata*, the beef tapeworm; the term *C. bovis* is frequently used to designate cysticerci of *T. bovis*.

Measles (mē'zēlz). 1. An acute exanthematous disease, caused by measles virus (genus *Morbillivirus*), a member of the family *Paramyxoviridae*, and marked by fever and other constitutional disturbances; a catarrhal inflammation of the respiratory mucous membrane, and a generalized dusky red maculopapular eruption; the eruption occurs early on the buccal mucous membrane in the form of Koplik spots, a manifestation useful in early diagnosis; average incubation period is from 10-12 days. Recovery is usually rapid. Respiratory complications and otitis media caused by secondary bacterial infections are common. Encephalitis occurs rarely. Chronic sclerosing parencephalitis may occur later and is associated with chronic infection. SYN *morbilli*. 2. A disease of swine caused by the presence of *Cysticercus cellulosae*, the measles or *measle* of *Taenia solium*, the pork tapeworm. 3. A disease of cattle caused by the presence of *Cysticercus bovis*, the measles or larva *measle* of *Taenia saginata*, the beef tapeworm of humans. See page C10, *measle*. SYN *first disease*. [D. *maselen*]

Measle m., sometimes severe, unusual clinical manifestation of

natural m. virus infection in people with waning vaccination immunity, particularly in those who had received formaldehyde-inactivated vaccine; an accelerated allergic reaction apparently resulting from an anamnestic antibody response, characterized by high fever, absence of Koplik spots, a shortened prodromal period, atypical rash, and pneumonia.

black m., (1) SYN hemorrhagic m.; (2) SYN Rocky Mountain spotted fever.

German m., SYN rubella.

hemorrhagic m., a severe form in which the eruption is dark in color due to effusion of blood into affected areas of the skin. SYN black m. (1).

three-day m., SYN rubella.

tropic m., a disease of uncertain character, somewhat resembling rubella, occurring in southern China.

measly (mēz'lē). Pertaining to pork or beef infected with the cysticerci of the tapeworms *Taenia solium* or *Taenia saginata*, respectively.

mea-sure (mē'zhūr). Avoid the mispronunciation māzh'er. 1. To determine the magnitude or quantity of a substance by comparing it against some accepted standard or by calculation. 2. A specified magnitude of a physical quantity. 3. A graduated instrument used to measure an object or substance. [O.F. *mesure*, fr. L. *mensura*, fr. *metior*, to measure]

Geneva lens m., a device for measuring the radii of the curvature of a spectacle lens. SYN lens clock. [*Geneva*, Switzerland]

mea-sure-ment (mē'zhūr-ment). Determination of a dimension or quantity. See page 1166.

end-point m., analytic m. at the end of a chemical reaction, as opposed to making the m. while the reaction proceeds.

kinetic m., continuous or frequent monitoring of the readings during a chemical reaction to determine its rate.

nasion-pogonion m., SYN *facial plane*.

mea-sures of cen-tral ten-den-cy (mē'zhūrz sen'trāl ten'den-sē). General term for several characteristics of the distribution of a set of measurements or values around a value or values at or near the middle of the set; the principal measures of central tendency are mean, median, and mode.

me-a-tal (mē-ā'tāl). Relating to a meatus.

meato- (mē-ā'tō). Meatus. [L. *meatus*, passage]

me-a-tom-e-ter (mē-ā-tom'ē-tēr). An instrument for measuring the size of a meatus, especially the meatus of the urethra. [meato- + G. *metron*, measure]

me-a-to-plas-ty (mē-ā-tō-plas'tē). Enlargement or other surgical reconfiguring of a meatus or canal, e.g., the external auditory meatus or the urethral meatus.

me-a-tor-rha-phy (mē-ā-tōr'ā-fē). Surgical repair of a meatus. [meato- + G. *rhaphe*, suture]

me-at-o-scope (mē-at'ō-skōp). A form of speculum for examining a meatus, especially the meatus of the urethra. [meato- + G. *skopeō*, to view]

me-a-tos-co-py (mē-ā-tōs'kō-pē). Inspection, usually instrumental, of any meatus, especially that of the urethra. [meato- + G. *skopeō*, to view]

me-at-o-tome (mē-at'ō-tōm). A knife with short cutting edge for use in meatotomy.

me-a-tot-o-my (mē-ā-tōt'ō-mē). An incision made to enlarge a meatus, e.g., of the urethra or ureter. [meato- + G. *tomē*, incision]

me-a-tus, pl. **me-a-tus** (mē-ā'tūs) [TA]. A passage or channel, especially the external opening of a canal. SYN external opening. [L. a going, a passage, fr. *meo*, pp. *meatus*, to go, pass]

acoustic m., (1) SYN external acoustic m.; (2) SYN external auditory canal.

m. acoustic externus [TA], SYN external acoustic m.

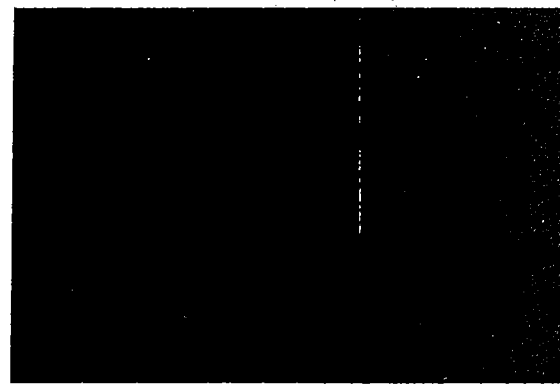
m. acoustic internus [TA], SYN internal acoustic m.

external acoustic m. [TA], the passage leading inward through the tympanic portion of the temporal bone, from the auricle to the tympanic membrane; it consists of a bony (inner) portion and a fibrocartilaginous (outer) portion, the cartilaginous external

CHEMICAL PRINCIPLES

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Samples of the alkali metals lithium, sodium, and potassium.

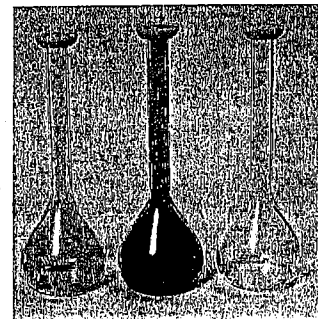


Metals tend to form positive ions; nonmetals tend to form negative ions.

above each symbol is the atomic number (number of protons) for that element. Most of the elements are metals. Metals have characteristic physical properties such as efficient conduction of heat and electricity, malleability (they can be hammered into thin sheets), ductility (they can be pulled into wires), and (often) a lustrous appearance. Chemically, metal atoms tend to *lose* electrons to form positive ions. For example, copper is a typical metal. It is lustrous (although it tarnishes readily); it is an excellent conductor of electricity (it is widely used in electrical wires); and it is readily formed into various shapes such as pipes for water systems. Copper is also found in many salts, such as the beautiful blue copper sulfate, in which copper is present as Cu^{2+} ions. Copper is a member of the transition metals—the metals shown in the center of the periodic table.

The relatively few nonmetals appear in the upper right-hand corner of the table (to the right of the heavy line in Fig. 2.18), except hydrogen, a nonmetal that is grouped with the metals. The nonmetals typically lack the physical properties that characterize the metals. Chemically, they tend to *gain* electrons to form anions in reactions with metals. Nonmetals often bond to each other by forming covalent bonds. For example, chlorine is a typical nonmetal. Under normal conditions it exists as Cl_2 molecules; it reacts with metals to form salts containing Cl^- ions (NaCl , for example); and it forms covalent bonds with nonmetals (for example, hydrogen chloride gas, or HCl).

The periodic table is arranged so that elements in the same vertical columns (called groups or families) have *similar chemical properties*. For example, all of the alkali metals, members of Group 1A—lithium (Li), sodium (Na), potassium (K), rubidium (Rb), cesium (Cs), and francium (Fr)—are very active elements that readily form ions with a $1+$ charge when they react with nonmetals. The members of Group 2A—beryllium (Be), magnesium (Mg), calcium (Ca), strontium (Sr), barium (Ba), and radium (Ra)—are called the alkaline earth metals. They all form ions with a $2+$ charge when they react with nonmetals. The halogens, the members of Group 7A—fluorine (F), chlorine (Cl), bromine (Br), iodine (I), and astatine (At)—all form diatomic molecules. Fluorine, chlorine, bromine, and iodine all react with metals to form salts containing ions with a $1-$ charge (F^- , Cl^- , Br^- , and I^-). The members of Group 8A—helium (He), neon (Ne), argon (Ar), krypton (Kr), xenon (Xe), and radon (Rn)—are known as the noble gases. They all exist under normal conditions as monatomic (single-atom) gases and have little chemical reactivity.



Three members of the halogen family: iodine (purple), bromine (reddish-brown), and chlorine (green).

The horizontal rows of elements in the periodic table are called periods. Horizontal row one is called the first period (it contains H and He); row two is called the second period (elements Li through Ne); and so on.

We will learn much more about the periodic table as we continue with our study of chemistry. Meanwhile, when an element is introduced in this text, you should always note its position on the periodic table.

2.9 Naming Simple Compounds

When chemistry was an infant science, there was no system for naming compounds. Names such as sugar of lead, blue vitrol, quicklime, Epsom salts, milk of magnesia, gypsum, and laughing gas were coined by early chemists. Such names are called *common names*. As chemistry grew, it became clear that using common names for compounds would lead to unacceptable chaos. More than 4 million chemical compounds are currently known. Memorizing common names for these compounds would be an impossible task.

The solution, of course, is to adopt a *system* for naming compounds in which the name tells something about the composition of the compound. After learning the system, a chemist given a formula should be able to name the compound, or given a name should be able to construct the compound's formula. In this section we will specify the most important rules for naming compounds other than organic compounds (those based on chains of carbon atoms).

We will begin with the systems for naming inorganic binary compounds—compounds composed of two elements—which we classify into various types for easier recognition. We will consider both ionic and covalent compounds.

Binary Compounds (Type I; Ionic)

Binary ionic compounds contain a positive ion (cation), always written first in the formula, and a negative ion (anion). In the naming of these compounds the following rules apply:

The systematic naming of organic compounds will be discussed in Chapter 22.