

(i) *High dose level.* The highest dose shall produce clear behavior effects or life-threatening toxicity. In addition, the highest dose should not exceed the lower explosive limit of commercial hexane.

(ii) *Duration and frequency of exposure.* Animals shall be dosed for 6 hours/day, 5 days/week for 90 days.

(iii) *Route of exposure.* Animals shall be exposed to commercial hexane by inhalation.

(ii) *Reporting requirements.* (A) The schedule-controlled operant behavior, functional observation battery, motor activity, and neuropathology tests shall be completed and the final reports submitted to EPA within 15 months of the effective date of the final rule.

(B) Interim progress reports for each test shall be submitted to EPA for the schedule-controlled operant behavior, functional observation battery, motor activity, and neuropathology tests at 6-month intervals beginning 6 months after the effective date of the applicable final rule, until the applicable final report is submitted to EPA.

(8) *Pharmacokinetics*—(i) *Required testing.* (A) Pharmacokinetics testing shall be conducted in rats in accordance with § 795.232 of this chapter, except for paragraph (c)(1)(ii) of § 795.232.

(B) For the purposes of this section, the following provisions also apply:

(1) *Test animals.* Adult male and female rats shall be used for testing. The rats shall be 9 to 11 weeks old and their weight range should be comparable from group to group. The animals shall be purchased from a reputable dealer and shall be permanently identified upon arrival. The animals shall be selected at random for the testing groups, and any animal showing signs of ill health shall not be used.

(2) *Species and strain.* The rat strain used shall be the same as the strain used in the subchronic and chronic tests required under § 798.2450(d)(1)(i) and § 798.3300(b)(1)(i).

(ii) *Reporting requirements.* (A) The inhalation and dermal pharmacokinetics tests shall be completed and the final report submitted to EPA by August 21, 1992.

(B) Interim progress reports shall be submitted to EPA for the inhalation

and dermal pharmacokinetics tests at 6-month intervals, beginning 6 months after the effective date specified in paragraph (d)(1) of this section, until the final report is submitted to EPA.

(d) *Effective date.* (1) The effective date of this final rule is November 17, 1988, except for the provisions of paragraphs (c)(2)(ii)(A), (c)(5)(i)(D), (c)(5)(ii)(A)(4), (c)(5)(ii)(C), (c)(8)(i) and (c)(8)(ii)(A) of this section. The effective date for paragraphs (c)(5)(i)(D), (c)(5)(ii)(A)(4) and (c)(5)(ii)(C) of this section is May 21, 1990. The effective date for paragraphs (c)(8)(i) and (c)(8)(ii)(A) of this section is June 12, 1992. The effective date of paragraph (c)(2)(ii)(A) is September 8, 1994.

(2) The guidelines and other test methods cited in this rule are referenced as they exist on the effective date of the final rule.

[53 FR 3392, Feb. 5, 1988, as amended at 53 FR 38953, Oct. 4, 1988; 55 FR 634, Jan. 8, 1990; 55 FR 7325, Mar. 1, 1990; 55 FR 12643, Apr. 5, 1990; 57 FR 24961, June 12, 1992; 58 FR 34205, June 23, 1993; 59 FR 46357, Sept. 8, 1994; 60 FR 34467, July 3, 1995; 69 FR 18803, Apr. 9, 2004]

#### § 799.2325 Isopropanol.

(a) *Identification of test substance.* (1) Isopropanol (CAS No. 67-63-0) shall be tested in accordance with this section.

(2) Isopropanol of at least 99.8 percent purity shall be used as the test substance.

(b) *Persons required to submit study plans, conduct tests, and submit data.* All persons who manufacture (including import or byproduct manufacture) or intend to manufacture or process isopropanol, from the effective date of this rule to the end of the reimbursement period, shall submit letters of intent to conduct testing, submit study plans, conduct tests, and submit data or submit exemption applications as specified in this section, subpart A of this part, and parts 790 and 792 of this chapter for single-phase rulemaking.

(c) *Health effects testing*—(1) *Subchronic inhalation toxicity*—(i) *Required testing.* A subchronic inhalation toxicity test shall be conducted with isopropanol in accordance with § 798.2450 of this chapter.

(ii) *Reporting requirements.* (A) The subchronic inhalation toxicity test shall be completed and the final report

submitted to EPA within 15 months of the date specified in paragraph (d) of this section.

(B) Progress reports shall be submitted to EPA for the subchronic inhalation toxicity test at 6-month intervals beginning 6 months after the date specified in paragraph (d)(1) of this section until submission of the final report.

(2) *Reproduction and fertility effects*—(i) *Required testing.* A reproduction and fertility effects test shall be conducted by gavage with isopropanol in accordance with § 798.4700 of this chapter.

(ii) *Reporting requirements.* (A) The reproduction and fertility effects test shall be completed and the final report submitted to EPA within 29 months of the date specified in paragraph (d)(1) of this section.

(B) Progress reports shall be submitted at 6-month intervals beginning 6 months after the date specified in paragraph (d)(1) of this section until submission of the final report.

(3) *Developmental toxicity*—(i) *Required testing.* A developmental toxicity test shall be conducted in two mammalian species by gavage with isopropanol in accordance with § 798.4900 of this chapter.

(ii) *Reporting requirements.* (A) The developmental toxicity test shall be completed and the final report submitted to EPA within 12 months of the date specified in paragraph (d)(1) of this section.

(B) A progress report shall be submitted 6 months after the date specified in paragraph (d)(1) of this section.

(4) *Mutagenic effects—gene mutations*—(i) *Required testing.* (A) A gene mutation test in mammalian cells shall be conducted with isopropanol in accordance with § 798.5300 of this chapter.

(B)(1) A sex-linked recessive lethal test in *Drosophila melanogaster* shall be conducted with isopropanol in accordance with § 798.5275 of this chapter, except for the provisions in paragraphs (d)(5)(ii) and (iii) of § 798.5275, unless the results of the mammalian cells in the culture gene mutation test conducted pursuant to paragraph (c)(5)(i)(A) of this section are negative.

(2) For the purpose of this section, the following provisions also apply:

(i) *Route of administration.* The route of administration shall be by exposure to isopropanol vapors or by injection of isopropanol.

(ii) [Reserved]

(C)(1) The mouse visible specific locus (MVSL) test shall be conducted with isopropanol by inhalation in accordance with § 798.5200, except for the provisions in paragraphs (d)(5)(ii) and (iii) of § 798.5200, if the results of the sex-linked recessive lethal test conducted pursuant to paragraph (c)(4)(i)(B) of this section are positive and if, after a public program review, EPA issues a FEDERAL REGISTER notice or sends a certified letter to the test sponsor specifying that the testing shall be initiated.

(2) For the purpose of this section, the following provisions also apply:

(i) *Dose levels and duration of exposure.* A minimum of 2 dose levels shall be tested. The duration of exposure shall be for 6 hours per day. Duration of exposure shall be dependent upon accumulated total dose desired for each group.

(ii) *Route of administration.* Animals shall be exposed to isopropanol by inhalation.

(ii) *Reporting requirements.* (A) The gene mutation tests shall be completed and final report submitted to EPA as follows:

(1) The gene mutation in mammalian cells assay within 6 months of the date specified in paragraph (d)(1) of this section.

(2) The sex-linked recessive-lethal test in *Drosophila melanogaster* within 18 months of the date specified in paragraph (d)(1) of this section.

(3) The mouse visible specific-locus test within 51 months of the date of EPA's notification of the test sponsor by certified letter or FEDERAL REGISTER notice under paragraph (c)(4)(i)(C) of this section that testing shall be initiated.

(B) Progress reports shall be submitted to EPA for the *Drosophila* sex-linked recessive lethal test at 6-month intervals beginning 6 months after the date specified in paragraph (d)(1) of this section until the submission of the final report.

(C) Progress reports shall be submitted to EPA for the mouse visible

specific locus test at 6-month intervals beginning 6 months after the date of EPA's notification of the test sponsor that testing shall be initiated until submission of the final report.

(5) *Mutagenic effects—chromosomal aberrations*—(i) *Required testing.* (A)(1) The micronucleus test shall be conducted with isopropanol in accordance with § 798.5395 of this chapter.

(2) For the purpose of this section, the following provisions also apply:

(i) *Route of administration.* Animals shall be exposed to isopropanol by either inhalation or oral gavage or intraperitoneally (IP).

(ii) *Duration of exposure.* For inhalation, the duration of exposure shall be for 6 hours per day for 5 consecutive days with one sacrifice time or for 6 hours for 1 day with three sacrifice times.

(B)(1) A dominant lethal assay shall be conducted with isopropanol in accordance with § 798.5450 of this chapter, except for the provisions in paragraphs (d)(5)(ii) and (iii) of § 798.5450, unless the micronucleus test conducted pursuant to paragraphs (c)(5)(i)(A) of this section is negative.

(2) For the purpose of this section, the following provisions also apply:

(i) *Route of administration.* Animals shall be exposed to isopropanol by inhalation.

(ii) *Duration of exposure.* The duration of exposure shall be for 6 hours per day for 5 consecutive days.

(C)(1) The mouse visible specific locus test (MVSL) shall be conducted with isopropanol by inhalation in accordance with § 798.5200 of this chapter, except for the provisions in paragraphs (d)(5)(ii) and (d)(5)(iii) of § 798.5200, or a mouse biochemical specific locus test (MBSL) shall be conducted with isopropanol by inhalation in accordance with § 798.5195 of this chapter, except for the provisions in paragraphs (d)(5)(ii) and (d)(5)(iii) of § 798.5195, if the results of the sex-linked recessive lethal test conducted pursuant to paragraph (c)(4)(i)(B) of this section are positive and if, after a public program review, EPA issues a FEDERAL REGISTER notice or sends a certified letter to the test sponsor specifying that the testing shall be initiated.

(2) For the purpose of this section, the following provisions also apply:

(i) *Route of administration.* Animals shall be exposed to isopropanol by inhalation.

(ii) [Reserved]

(ii) *Reporting requirements.* (A) The chromosomal aberration tests shall be completed and the final reports submitted to EPA as follows:

(1) The micronucleus test within 15 months of the date specified in paragraph (d)(1) of this section.

(2) The dominant lethal assay within 27 months of the date specified in paragraph (d)(1) of this section.

(3) The MVSL or MBSL test within 51 months of the date of EPA's notification of the test sponsor by certified letter or FEDERAL REGISTER notice under paragraph (c)(4)(i)(C) of this section that testing shall be initiated.

(B) Progress reports shall be submitted to EPA for the micronucleus and the dominant lethal assays at 6-month intervals beginning 6 months after the date specified in paragraph (d)(1) of this section until submission of the final report.

(C) Progress reports shall be submitted to EPA for the heritable translocation assay at 6-month intervals beginning 6 months after the date of EPA's notification of the test sponsor that testing shall be initiated until submission of the final report.

(6) *Neurotoxicity*—(i) *Required testing.* (A)(1) A functional observation battery shall be conducted with isopropanol in accordance with § 798.6050 of this chapter except for the provisions in paragraphs (d)(5) and (6) of § 798.6050.

(2) For the purpose of this section, the following provisions also apply:

(i) *Duration and frequency of exposure.* For subchronic study, animals shall be dosed for 6 hours per day, 5 days per week for 90 days. For acute study, animals shall be dosed for 4 to 6 hours once.

(ii) *Route of exposure.* Animals shall be exposed to isopropanol by inhalation.

(B)(1) A motor activity test shall be conducted with isopropanol in accordance with § 798.6200 of this chapter except for the provisions in paragraphs (d)(5) and (6) of § 798.6200.

(2) For the purpose of this section, the following provisions also apply:

(i) *Duration of exposure.* For subchronic study, animals shall be dosed for 6 hours per day, 5 days per week for 90 days. For acute study, animals shall be dosed for 4 to 6 hours once.

(ii) *Route of exposure.* Animals shall be exposed to isopropanol by inhalation.

(C)(1) A neuropathology test shall be conducted with isopropanol in accordance with § 798.6400 of this chapter except for the provisions in paragraphs (d)(5) and (6) of § 798.6400.

(2) For the purpose of this section, the following provisions also apply:

(i) *Duration of exposure.* Animals shall be dosed for 6 hours per day, 5 days per week for 90 days.

(ii) *Route of exposure.* Animals shall be exposed to isopropanol by inhalation.

(D) The developmental neurotoxicity test shall be conducted with isopropanol in accordance with § 795.250 of this chapter, except for paragraph (c)(1)(iv).

(1) For purposes of this section, the following provisions also apply:

(i) *Numbers of animals.* The objective is for a sufficient number of pregnant rats to be exposed to ensure that an adequate number of offspring are produced for neurotoxicity evaluation. At least 24 litters shall be used at each dose level.

(ii) [Reserved]

(2) [Reserved]

(ii) *Reporting requirements.* (A) The acute functional observation battery and motor activity tests shall be completed and the final report submitted to EPA within 15 months of the date specified in paragraph (d)(1) of this section. The subchronic functional observation battery, motor activity, and neuropathology tests shall be completed and the final reports submitted to EPA within 18 months of the date specified in paragraph (d)(1) of this section. The developmental neurotoxicity test shall be completed and the final report submitted to EPA within 21 months of the date specified in paragraph (d)(1) of this section.

(B) Progress reports shall be submitted to EPA for the functional observation battery, motor activity,

neuropathology, and developmental neurotoxicity tests at 6-month intervals beginning 6 months after the date specified in paragraph (d)(1) of this section until submission of the applicable final report.

(7) *Pharmacokinetics studies*—(i) *Required testing.* An oral and inhalation pharmacokinetics test shall be conducted with isopropanol in accordance with § 795.231 of this chapter.

(ii) *Reporting requirements.* (A) The pharmacokinetic test shall be completed and the final report submitted to EPA within 15 months of the date specified in paragraph (d)(1) of this section.

(B) Progress reports shall be submitted to EPA for the pharmacokinetics test at 6-month intervals beginning 6 months after the date specified in paragraph (d)(1) of this section until submission of the final report.

(8) *Oncogenicity*—(i) *Required testing.* An oncogenicity test shall be conducted by inhalation with isopropanol in accordance with § 798.3300 of this chapter.

(ii) *Reporting requirements.* (A) The oncogenicity test shall be completed and the final report submitted to EPA by July 5, 1994.

(B) Progress reports shall be submitted at 6-month intervals beginning 6 months after the date specified in paragraph (d)(1) of this section until submission of the final report.

(d) *Effective date.* (1) The effective date of this final rule is December 4, 1989, except for the provisions of paragraphs (c)(5)(i)(C)(1), (c)(5)(ii)(A)(3), (c)(6)(i)(D), and (c)(8)(ii)(A), of this section. The effective date for paragraphs (c)(5)(i)(C)(1), and (c)(5)(ii)(A)(3) of this section is May 21, 1990. The effective date for paragraphs (c)(6)(i)(D) of this section is May 21, 1991. The effective date of paragraph (c)(8)(ii)(A) is September 29, 1995.

(2) The guidelines and other test methods cited in this rule are references as they exist on the effective date of the final rule.

[54 FR 43262, Oct. 23, 1989, as amended at 55 FR 12644, Apr. 5, 1990; 56 FR 23231, May 21, 1990; 58 FR 34205, June 23, 1993; 60 FR 56956, Nov. 13, 1995]