

## Occupational Safety and Health Admin., Labor

§ 1910.1027

Orange; Cadmium Primrose 819; Cadmium Sulphide; Cadmium Yellow; Cadmium Yellow 000; Cadmium Yellow Conc. Deep; Cadmium Yellow Conc. Golden; Cadmium Yellow Conc. Lemon; Cadmium Yellow Conc. Primrose; Cadmium Yellow Oz. Dark; Cadmium Yellow Primrose 47-1400; Cadmium Yellow 10G Conc.; Cadmium Yellow 892; Cadmopur Golden Yellow N; Cadmopur Yellow; Capsebon; C.I. 77199; C.I. Pigment Orange 20; CI Pigment Yellow 37; Ferro Lemon Yellow; Ferro Orange Yellow; Ferro Yellow; Greenockite; NCI-C02711.

## 2. Physical data.

*Boiling point* (760 mm. Hg): sublimes in N<sub>2</sub> at 980 °C.

*Melting point*: 1750 degrees C (100 atm).

*Specific Gravity*: (H<sub>2</sub>O=1 @ 20 °C): 4.82.

*Solubility*: Slightly soluble in water; soluble in acid.

*Appearance*: Light yellow or yellow-orange crystals.

## B. Fire, Explosion and Reactivity Data.

## 1. Fire.

*Fire and Explosion Hazards*: Negligible fire hazard when exposed to heat or flame.

*Flash point*: Nonflammable.

*Extinguishing media*: Dry chemical, carbon dioxide, water spray or foam.

## 2. Reactivity.

*Conditions contributing to instability*: Generally non-reactive under normal conditions. Reacts with acids to form toxic hydrogen sulfide gas.

*Incompatibilities*: Reacts vigorously with iodine monochloride.

*Hazardous decomposition products*: Toxic fumes of cadmium and sulfur oxides.

## C. Spill Leak and Disposal Procedures.

1. *Steps to be taken if the material is released or spilled*. Do not touch spilled material. Stop leak if you can do it without risk. For small, dry spills, with a clean shovel place material into clean, dry container and cover. Move containers from spill area. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away. Isolate hazard and deny entry.

## IV. Cadmium Chloride.

## A. Physical and Chemical Data.

## 1. Substance Identification.

*Chemical name*: Cadmium chloride.

*Formula*: CdCl<sub>2</sub>.

*Molecular weight*: 183.3.

*CAS No.* 10108-64-2.

*Other Identifiers*: RTECS EY0175000.

*Synonyms*: Caddy; Cadmium dichloride; NA 2570 (DOT); UI-CAD; dichlorocadmium.

## 2. Physical data.

*Boiling point* (760 mm Hg): 960 degrees C.

*Melting point*: 568 degrees C.

*Specific Gravity*: (H<sub>2</sub>O=1 @ 20 °C): 4.05.

*Solubility*: Soluble in water (140 g/100 cc); soluble in acetone.

*Appearance*: Small, white crystals.

## B. Fire, Explosion and Reactivity Data.

## 1. Fire.

*Fire and Explosion Hazards*: Negligible fire and negligible explosion hazard in dust form when exposed to heat or flame.

*Flash point*: Nonflammable.

*Extinguishing media*: Dry chemical, carbon dioxide, water spray or foam.

## 2. Reactivity.

*Conditions contributing to instability*: Generally stable under normal temperatures and pressures.

*Incompatibilities*: Bromine trifluoride rapidly attacks cadmium chloride. A mixture of potassium and cadmium chloride may produce a strong explosion on impact.

*Hazardous decomposition products*: Thermal decomposition may release toxic fumes of hydrogen chloride, chloride, chlorine or oxides of cadmium.

## C. Spill Leak and Disposal Procedures.

1. *Steps to be taken if the material is released or spilled*. Do not touch spilled material. Stop leak if you can do it without risk. For small, dry spills, with a clean shovel place material into clean, dry container and cover. Move containers from spill area. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away. Isolate hazard and deny entry. The Superfund Amendments and Reauthorization Act of 1986 Section 304 requires that a release equal to or greater than the reportable quantity for this substance (100 pounds) must be immediately reported to the local emergency planning committee, the state emergency response commission, and the National Response Center (800) 424-8802; in Washington, DC Metropolitan area (202) 426-2675.

## APPENDIX C TO § 1910.1027 [RESERVED]

## APPENDIX D TO § 1910.1027—OCCUPATIONAL HEALTH HISTORY INTERVIEW WITH REFERENCE TO CADMIUM EXPOSURE

## Directions

(To be read by employee and signed prior to the interview)

Please answer the questions you will be asked as completely and carefully as you can. These questions are asked of everyone who works with cadmium. You will also be asked to give blood and urine samples. The doctor will give your employer a written opinion on whether you are physically capable of working with cadmium. Legally, the doctor cannot share personal information you may tell him/her with your employer. The following information is considered strictly confidential. The results of the tests will go to you, your doctor and your employer. You will also receive an information sheet explaining the results of any biological monitoring or physical examinations performed.

If you are just being hired, the results of this interview and examination will be used to:

Future PRA Burden  
Box will appear  
here.

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(1) Establish your health status and see if working with cadmium might be expected to cause unusual problems,

(2) Determine your health status today and see if there are changes over time,

(3) See if you can wear a respirator safely. If you are not a new hire:

OSHA says that everyone who works with cadmium can have periodic medical examinations performed by a doctor. The reasons for this are:

(a) If there are changes in your health, either because of cadmium or some other reason, to find them early,

(b) to prevent kidney damage.

Please sign below.

I have read these directions and understand them:

Employee signature \_\_\_\_\_

Date \_\_\_\_\_

Thank you for answering these questions. (Suggested Format)

Name \_\_\_\_\_

Age \_\_\_\_\_

Social Security # \_\_\_\_\_

Company \_\_\_\_\_

Job \_\_\_\_\_

Type of Preplacement Exam:

[ ] Periodic

[ ] Termination

[ ] Initial

[ ] Other

Blood Pressure \_\_\_\_\_

Pulse Rate \_\_\_\_\_

1. How long have you worked at the job listed above?

[ ] Not yet hired

[ ] Number of months

[ ] Number of years

2. Job Duties etc.

3. Have you ever been told by a doctor that you had bronchitis?

[ ] Yes

[ ] No

If yes, how long ago?

[ ] Number of months

[ ] Number of years

4. Have you ever been told by a doctor that you had emphysema?

[ ] Yes

[ ] No

If yes, how long ago?

[ ] Number of years

[ ] Number of months

5. Have you ever been told by a doctor that you had other lung problems?

[ ] Yes

[ ] No

If yes, please describe type of lung problems and when you had these problems

6. In the past year, have you had a cough?

[ ] Yes

[ ] No

If yes, did you cough up sputum?

[ ] Yes

[ ] No

If yes, how long did the cough with sputum production last?

[ ] Less than 3 months

[ ] 3 months or longer

If yes, for how many years have you had episodes of cough with sputum production lasting this long?

[ ] Less than one

[ ] 1

[ ] 2

[ ] Longer than 2

7. Have you ever smoked cigarettes?

[ ] Yes

[ ] No

8. Do you now smoke cigarettes?

[ ] Yes

[ ] No

9. If you smoke or have smoked cigarettes, for how many years have you smoked, or did you smoke?

[ ] Less than 1 year

[ ] Number of years

What is or was the greatest number of packs per day that you have smoked?

[ ] Number of packs

If you quit smoking cigarettes, how many years ago did you quit?

[ ] Less than 1 year

[ ] Number of years

How many packs a day do you now smoke?

[ ] Number of packs per day

10. Have you ever been told by a doctor that you had a kidney or urinary tract disease or disorder?

[ ] Yes

[ ] No

11. Have you ever had any of these disorders?

Kidney stones ..... [ ] Yes [ ] No

Protein in urine ..... [ ] Yes [ ] No

Blood in urine ..... [ ] Yes [ ] No

Difficulty urinating ..... [ ] Yes [ ] No

Other kidney/Urinary disorders. [ ] Yes [ ] No

Please describe problems, age, treatment, and follow up for any kidney or urinary problems you have had:

12. Have you ever been told by a doctor or other health care provider who took your blood pressure that your blood pressure was high?

[ ] Yes

[ ] No

13. Have you ever been advised to take any blood pressure medication?

Removed



- Yes
- No
- 14. Are you presently taking any blood pressure medication?
  - Yes
  - No
- 15. Are you presently taking any other medication?
  - Yes
  - No
- 16. Please list any blood pressure or other medications and describe how long you have been taking each one:

Medicine: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

How Long Taken \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- 17. Have you ever been told by a doctor that you have diabetes? (sugar in your blood or urine)
  - Yes
  - No
 If yes, do you presently see a doctor about your diabetes?
  - Yes
  - No
 If yes, how do you control your blood sugar?
  - Diet alone
  - Diet plus oral medicine
  - Diet plus insulin (injection)
- 18. Have you ever been told by a doctor that you had:
  - Anemia .....  Yes  No
  - A low blood count? .....  Yes  No
- 19. Do you presently feel that you tire or run out of energy sooner than normal or sooner than other people your age?
  - Yes
  - No
 If yes, for how long have you felt that you tire easily?
  - Less than 1 year
  - Number of years
- 20. Have you given blood within the last year?
  - Yes
  - No
 If yes, how many times?
  - Number of times
 How long ago was the last time you gave blood?
  - Less than 1 month
  - Number of months
- 21. Within the last year have you had any injuries with heavy bleeding?
  - Yes
  - No
 If yes, how long ago?
  - Less than 1 month
  - Number of months
 Describe: \_\_\_\_\_  
 \_\_\_\_\_

- 22. Have you recently had any surgery?
  - Yes
  - No
 If yes, please describe: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- 23. Have you seen any blood lately in your stool or after a bowel movement?
  - Yes
  - No
- 24. Have you ever had a test for blood in your stool?
  - Yes
  - No
 If yes, did the test show any blood in the stool?
  - Yes
  - No
 What further evaluation and treatment were done? \_\_\_\_\_  
 \_\_\_\_\_

The following questions pertain to the ability to wear a respirator. Additional information for the physician can be found in The Respiratory Protective Devices Manual.

- 25. Have you ever been told by a doctor that you have asthma?
  - Yes
  - No
 If yes, are you presently taking any medication for asthma? Mark all that apply.
  - Shots
  - Pills
  - Inhaler
- 26. Have you ever had a heart attack?
  - Yes
  - No
 If yes, how long ago?
  - Number of years
  - Number of months
- 27. Have you ever had pains in your chest?
  - Yes
  - No
 If yes, when did it usually happen?
  - While resting
  - While working
  - While exercising
  - Activity didn't matter
- 28. Have you ever had a thyroid problem?
  - Yes
  - No
- 29. Have you ever had a seizure or fits?
  - Yes
  - No
- 30. Have you ever had a stroke (cerebrovascular accident)?
  - Yes
  - No
- 31. Have you ever had a ruptured eardrum or a serious hearing problem?
  - Yes
  - No

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32. Do you now have a claustrophobia, meaning fear of crowded or closed in spaces or any psychological problems that would make it hard for you to wear a respirator?

- Yes
- No

The following questions pertain to reproductive history.

33. Have you or your partner had a problem conceiving a child?

- Yes
- No

If yes, specify:

- Self
- Present mate
- Previous mate

34. Have you or your partner consulted a physician for a fertility or other reproductive problem?

- Yes
- No

If yes, specify who consulted the physician:

- Self
- Spouse/partner
- Self and partner

If yes, specify diagnosis made: \_\_\_\_\_

35. Have you or your partner ever conceived a child resulting in a miscarriage, still birth or deformed offspring?

- Yes
- No

If yes, specify:

- Miscarriage
- Still birth
- Deformed offspring

If outcome was a deformed offspring, please specify type: \_\_\_\_\_

36. Was this outcome a result of a pregnancy of:

- Yours with present partner
- Yours with a previous partner

37. Did the timing of any abnormal pregnancy outcome coincide with present employment?

- Yes
- No

List dates of occurrences: \_\_\_\_\_

38. What is the occupation of your spouse or partner? \_\_\_\_\_

For Women Only

39. Do you have menstrual periods?

- Yes
- No

Have you had menstrual irregularities?

- Yes
- No

If yes, specify type: \_\_\_\_\_

If yes, what was the approximated date this problem began? \_\_\_\_\_

Approximate date problem stopped? \_\_\_\_\_

For Men Only

40. Have you ever been diagnosed by a physician as having prostate gland problem(s)?

- Yes
- No

If yes, please describe type of problem(s) and what was done to evaluate and treat the problem(s): \_\_\_\_\_

APPENDIX E TO §1910.1027—CADMIUM IN WORKPLACE ATMOSPHERES

Method Number: ID-189

Matrix: Air

OSHA Permissible Exposure Limits: 5 µg/m<sup>3</sup> (TWA), 2.5 µg/m<sup>3</sup> (Action Level TWA)

Collection Procedure: A known volume of air is drawn through a 37-mm diameter filter cassette containing a 0.8-µm mixed cellulose ester membrane filter (MCEF).

Recommended Air Volume: 960 L

Recommended Sampling Rate: 2.0 L/min

Analytical Procedure: Air filter samples are digested with nitric acid. After digestion, a small amount of hydrochloric acid is added. The samples are then diluted to volume with deionized water and analyzed by either flame atomic absorption spectroscopy (AAS) or flameless atomic absorption spectroscopy using a heated graphite furnace atomizer (AAS-HGA).

Detection Limits:

Qualitative: 0.2 µg/m<sup>3</sup> for a 200 L sample by Flame AAS, 0.007 µg/m<sup>3</sup> for a 60 L sample by AAS-HGA

Quantitative: 0.70 µg/m<sup>3</sup> for a 200 L sample by Flame AAS, 0.025 µg/m<sup>3</sup> for a 60 L sample by AAS-HGA

Precision and Accuracy: (Flame AAS Analysis and AAS-HGA Analysis):

Validation Level: 2.5 to 10 µg/m<sup>3</sup> for a 400 L air vol, 1.25 to 5.0 µg/m<sup>3</sup> for a 60 L air vol CV, (pooled): 0.010, 0.043

Analytical Bias: +4.0%, -5.8%

Overall Analytical Error: ±6.0%, ±14.2%

Method Classification: Validated

Date: June, 1992

Inorganic Service Branch II, OSHA Salt Lake Technical Center, Salt Lake City, Utah  
Commercial manufacturers and products mentioned in this method are for descriptive use only and do not constitute endorsements by USDOL-OSHA. Similar products from other sources can be substituted.