

6/2/2010

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**Review:** NIOSH Skin Notations Review - Group A  
**Profile Number:** 13  
**Profile Title:** Hydrazine

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### Summary

Both reviewers agreed that the document clearly outlines the systemic health hazards, direct health hazards, and immune-mediated responses associated with skin exposure to Hydrazine. The scientific rationale behind the skin notation assignments was judged to be sufficient and adequately described.

### Recommendations

- It might be stated somewhere that hydrazine salts, like hydrazine sulfate, are not considered here. (Q1, Reviewer 2)

#### Suggested additional scientific data to review:

- Toxicokinetics of percutaneously absorbed hydrazine in rabbits  
By Guo, Qiaozhen; Guan, Yongbiao; Zhang, Baozhen. Junshi Yixue Kexueyuan Yuankan (1995), 19(1), 6-9. Language: Chinese (Q12, Reviewer 2)
- Exposure to hydrazine and its control in power plants. Kauppinen, Timo P.; Alho, Juha M.; Lindroos, Lasse O. Applied Industrial Hygiene (1989), 4(10), 245-50. Language: English (Q12, Reviewer 2)

### Verbatim Reviewer Comments

**1. Does this document clearly outline the systemic health hazards associated with exposures of the skin to the chemical? If not, what specific information is missing from the document?**

Reviewer 1:

Yes, I think this is an inclusive document.

Reviewer 2:

Yes.

It might be stated somewhere that hydrazine salts like hydrazine sulfate are not considered here.

**2. If the SYS or SYS (FATAL) notations are assigned, is the rationale and logic behind the assignment clear? If not assigned, is the logic clear why it was not (e.g., insufficient data, no identified health hazard)?**

Reviewer 1:

Yes, SYS(FATAL) is appropriate and the logic is clear.

Reviewer 2:

SYS 9FATAL) clearly justified.

**3. Does this document clearly outline the direct (localized) health hazards associated with exposures of the skin to the chemical? If not, what specific information is missing from the document?**

Reviewer 1:

Yes.

Reviewer 2:

Direct effects clearly outlined.

**4. If the DIR, DIR (IRR), or DIR (COR) notations are assigned, is the rationale and logic behind the assignment clear? If not assigned, is the logic clear why it was not (e.g., insufficient data, no identified health hazard)?**

Reviewer 1:

DIR is appropriate and rationale well explained.

Reviewer 2:

DIR (COR) was clearly justified.

**5. Does this document clearly outline the immune-mediated responses (allergic response) health hazards associated with exposures of the skin to the chemical? If not, what specific information is missing from the document?**

Reviewer 1:

Yes.

Reviewer 2:

Immune-mediated responses outlined clearly.

**6. If the SEN notation is assigned, is the rationale and logic behind the assignment clear? If not assigned, is the logic clear why it was not (e.g., insufficient data, no identified health hazard)?**

Reviewer 1:

SEN is appropriate and well documented.

Reviewer 2:

SEN notation was clearly justified

**7. If the ID<sup>(SK)</sup> or SK were assigned, is the rationale and logic outlined within the document?**

Reviewer 1:

N/A

Reviewer 2:

OK

**8. Are the conclusions supported by the data?**

Reviewer 1:

Yes, lots of animal data.

Reviewer 2:

Yes

**9. Are the tables clear and appropriate?**

Reviewer 1:

yes.

Reviewer 2:

Yes

**10. Is the document organized appropriately? If not, what improvements are needed?**

Reviewer 1:

It's good.

Reviewer 2:

Yes

**11. Is the language of the manuscript acceptable as written? If not, what improvements are needed?**

Reviewer 1:

Yes, well written.

Reviewer 2:

Yes

**12. Are you aware of any scientific data reported in governmental publications, databases, peer reviewed journals, or other sources that should be included within this document?**

Reviewer 1:

no.

Reviewer 2:

1. Toxicokinetics of percutaneously absorbed hydrazine in rabbits

By Guo, Qiaozhen; Guan, Yongbiao; Zhang, Baozhen. Junshi Yixue Kexueyuan Yuankan (1995), 19(1), 6-9. Language: Chinese

The concn.-time curves of hydrazine in blood were in agreement with a single-compartment model of 1st-order after giving 17.4 and 41.7 mg·kg<sup>-1</sup> of hydrazine percutaneously, and a 2-compartment open model after giving 7.0 mg·kg<sup>-1</sup> of hydrazine i.v. Hydrazine could rapidly be absorbed through the skin of rabbits without lag time. The half-life of absorption was 0.16-0.42 h and the absorption fraction was ~60%. The distribution of hydrazine in rabbits was very rapid and wide with  $t_{1/2\alpha} = 0.021$  h and  $V_{ss} = 1.48$  L·kg<sup>-1</sup>, and the elimination of hydrazine was rapid with  $t_{1/2} = 1.49$ -3.80 h. The accumulation of hydrazine in

rabbits was low. Renal clearance was only 37%-47% of the total body clearance, indicating that there were other elimination pathways.

2. Exposure to hydrazine and its control in power plants. Kauppinen, Timo P.; Alho, Juha M.; Lindroos, Lasse O. Applied Industrial Hygiene (1989), 4(10), 245-50. Language: English

The use of hydrazine in power plants was surveyed to detect differences in exposure when alternative tech. procedures were used in the handling of N<sub>2</sub>H<sub>4</sub>. The exposure level of employees in 8 plants were estd. based on the concn. of N<sub>2</sub>H<sub>4</sub> in the air and the potential absorption through the skin. About 500 employees dosed and dild. strong (15% or 35%) N<sub>2</sub>H<sub>4</sub> soln. The dosing was usually done with a pump or an ejector in large plants and with a measure in small plants. The airborne N<sub>2</sub>H<sub>4</sub> concns. in the rooms where N<sub>2</sub>H<sub>4</sub> was handled were: <0.01-0.06 ppm (mean <0.02 ppm) for dosing with measure; <0.01-0.37 ppm (mean 0.12 ppm) for dosing with pump; <0.01-0.33 ppm (mean 0.09 ppm) for dosing with ejector, tank not closed; and <0.01-0.04 ppm (mean 0.02 ppm) for dosing with ejector, tank closed and equipped with exhaust. The time-weighted av. (TW) concn. of N<sub>2</sub>H<sub>4</sub> in the air during the workday was <0.1 ppm. However, heavy exposure may occur if strong N<sub>2</sub>H<sub>4</sub> is frequently splashed or spilled on the skin during handling. Because N<sub>2</sub>H<sub>4</sub> is a suspected human carcinogen and sensitizing agent, it is advisable to avoid even light exposure. Some methods to prevent dermal and inhalation exposure are presented and discussed.

**13. What is your final recommendation for this manuscript? (Do you agree with the scientific rationale that serves as a basis for the skin notation assignments?)**

Reviewer 1:

Looks good. Rationale is supportive.

Reviewer 2:

Acceptable