MINISTRY OF MANPOWER

21 July 2017

Users of Tetramethylammonium hydroxide (TMAH), and Other Interested Parties

CIRCULAR ON HAZARDS OF TETRAMETHYLAMMONIUM HYDROXIDE (TMAH)

In a recent workplace accident which took place in a manufacturing facility, an engineer was found unconscious next to the machine he was working on during maintenance work. Tetramethylammonium Hydroxide (TMAH) was one of the hazardous chemicals used in the machine.

2 TMAH is an ammonium salt widely used in micro- or nanofabrication as an etchant and developer. It is a common ingredient used in commercial etching/stripping mixtures. It may also be used as a pure chemical. Besides being a highly corrosive chemical, TMAH can attack the nervous system leading to weakness, breathing difficulties, loss of consciousness, coma and even death. There have been cases of TMAH poisoning reported in Taiwan and Korea[1,2] where the workers were exposed to this chemical during maintenance work.

3 Industry is reminded that any person working in laboratories or manufacturing facilities that use TMAH must be familiar with its toxic effects and assess the information in the Safety Data Sheet (SDS). Risk assessment involving the use of TMAH and Safe Work Procedures (SWP) must be established for works involving TMAH, including maintenance work.

4 This circular serves to inform users of TMAH on its corrosive and neurotoxic hazards and the safe use and handling of TMAH. Companies using TMAH are to review their existing procedures and align to the following:

Risk Management

- Hazards of TMAH and risk of exposure to be included in the risk assessment (routine and non-routine work)
- SWP to be established for works involving TMAH, including maintenance work
- To implement adequate control measures including the provision of splash protection, such as chemical resistant gloves, apron, face shield and chemical goggles to workers
- Personal protective equipment to be properly maintained and worn by workers when working with TMAH

Hazard Communications

- SDS of TMAH to be readily available to persons who are exposed to or handling this chemical
- Hazards of TMAH and the precautionary measures to be communicated to the users

Emergency Response and First Aid

- Emergency planning and first aid procedures on TMAH to be developed and communicated to the users

5 The above information is for your attention and necessary actions, please.

Yours faithfully,

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References

1. Lin CC, Yang CC, Ger J, Deng JF, Hung DZ. Tetramethylammonium hydroxide poisoning. Clinical Toxicology 2010; 48: 213–217.
2. Park SH, Park J, You KH, Shin HC, Kim HO. Tetramethylammonium Hydroxide Poisoning during a Pallet Cleaning Demonstration. Journal Occupational Health 2013; 55:120-124.

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