

Proposed Waste Classification Criteria of Chemicals released from Chemical Accidents

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A lot of toxic or hazardous chemicals are released from various types of chemical accidents including fire, explosion, and leaking during handlings and transports of chemicals (raw, intermediate and product). Unfortunately, the released chemicals can generate serious environmental issues or impacts including adverse health effects to humans and animals. To minimize those adverse impacts or to protect people or facilities from the exposure to the released chemicals or wastes produced from primary treatments, proper management or disposal should be developed and applied. However, there are no specific guidelines to deal with them properly. Thus most of the chemicals or wastes obtained from chemical accidents or treatments have been disposed of as hazardous or designated wastes, which require heavy economical burdens. This study presents a proposed classification and disposal procedures or methods to deal with the chemical wastes produced from primary treatments applied to treat or dispose of the chemicals released from chemical accidents. This study proposed a categorizing method to classify properly the released or obtained chemical wastes and then to apply proper disposal methods based on their classifications. The proposed categorization is adapting their individual or integral scores of the chemicals or wastes based on NFPA, pH, and inflammability rating methods. The chemicals or wastes are assigned by scores according to the U.S. National Fire Protection Association (NFPA) rating system, which is given on a class or score of 0 to 4, based on the degree of their health risk (blue diamond), flammability (red diamond), and reactivity (yellow diamond) (Fig. 1). The unusual water reactivity (W) or oxidative capability (oxy) of chemical substances, etc., according to the NFPA rating system, is also assigned as a special class or score. The pH class or score of 0 to 4 of interest acidic or basic chemical substances or wastes is also assigned by referring the Korean regulations of the designated waste classification and their H⁺ or OH⁻ strength. The inflammability rating is based on the class given by NFPA or Material Safety Data Sheet (MSDS). Then chemicals or wastes are classified as designated or general wastes, relying on the individual or integrated scores, and then disposed of according to their class.

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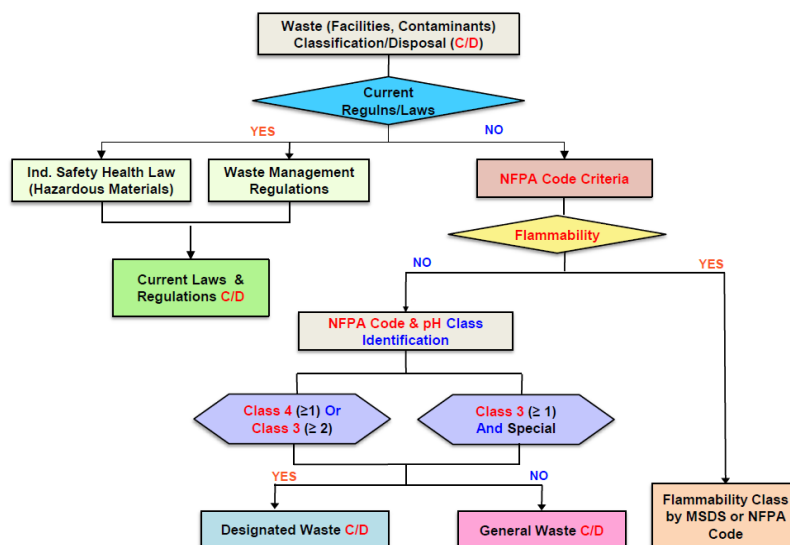


Fig. 1: A proposed classification and disposal of chemicals from primary treatment.