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EXPOSURE ASSESSMENT OF PROPYLENE LEAKAGE FROM A STORAGE TANK IN A CHEMICAL PARK IN TIANCHANG CITY, CHINA

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Abstract

Propylene is toxic, highly flammable and explosive. The leakage from storage tanks with large quantities of propylene has significant potential to cause damage to the surrounding area and environment and is closely related to the climatic data of different seasons. The present study explores the exposure assessment with threat zones of propylene leaks from a 2000 m^3 tank in various seasons using Areal Locations of Hazardous Atmospheres software. The results suggest that in summer, the threat zones are the largest for the toxic propylene vapor cloud, flammability and overpressure generated by the vapor cloud explosion. The hazard areas caused by the thermal radiation from the jet fire scenario do not change significantly within the four seasons. The greatest thermal radiation areas occur in winter from a boiling liquid expanding vapor explosion accident of propylene leakage. In the scenarios of propylene leakage, the maximum threat distances of toxicity, flammability, overpressure, jet fire and boiling liquid expanding vapor explosion accident are 1500, 1200, 593, 202 and 2800 m, respectively. This study will play an important role in the safety management and emergency responses of propylene plants to reduce losses and harmful effects.

Key words: leakage, propylene, seasons, tank, threat zones

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