Effective removal of volatile organic compounds released from industrial tanks in petrochemical industries

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Abstract: Many of volatile organic compounds (VOCs) are regulated as hazardous air pollutants because they can increase ground-level ozone concentrations and be precursors of secondary formation of fine particles (PM2.5) in ambient air. Many of VOCs can be dangerous because some of them can be explosives and are known or suspecting carcinogens. A large amount of VOCs is released from many industrial processes or activities including petrochemicals production or refinery facilities, shipbuilding and automobile manufacturing processes, tank refueling and cleaning processes. Currently, many industries adapt adsorption, biological treatments, and incineration technologies as conventional approaches for industrial VOCs abatements, depending upon emission concentrations, total amounts, and chemical types of VOCs as well as available technologies. However, many industries are suffering from a lot of difficulties in properly controlling VOCs released from industrial tanks which store chemicals (VOCs), during in particular regular cleaning processes or replacing/refueling with other chemicals. It is because there are many obstacles or difficulties to apply proper VOCs control technologies to industrial tanks which have a large variability in tanks size, handling chemicals, location, and application scale of control technology. This study presents some VOCs abatement technologies that are currently applying to industrial tanks over their cleaning processes or chemicals replacing/refueling processes, depending upon types and amounts of chemicals (VOCs) released from the tanks using mobile-based control technologies. Then finally this study proposes proper VOCs control technologies, considering vapor recovery, which can be applicable to the industrial tanks operating from particularly petrochemical industries.

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