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Occupational exposure to benzene at the ExxonMobil Refinery in Baytown, TX (1978–2006)

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Although occupational benzene exposure of refinery workers has been studied for decades, no extensive analysis of historical industrial hygiene data has been performed focusing on airborne concentrations at specific refineries and tasks. This study characterizes benzene exposures at the ExxonMobil Baytown, TX, refinery from 1978 to 2006 to understand the variability in workers' exposures over time and during different job tasks. Exposures were grouped by operational status, job title, and tasks. More than 9000 industrial hygiene air samples were evaluated; approximately 4000 non-task (43h) and 1000 task-related (0.3 h) personal samples were considered. Each sample was assigned to one of 27 job titles, 29 work areas, and 16 task bins (when applicable). Process technicians were sampled most frequently, resulting in the following mean benzene concentrations by area: hydrofiner (n=245, mean=1.3 p.p.m.), oil movements (n=286, mean=0.23 p.p.m.), reformer (n=575, mean=0.10 p.p.m.), tank farm (n=49, mean=0.65 p.p.m.), waste treatment (n=446, mean=0.13 p.p.m.), and other areas (n=460, mean=0.062 p.p.m.). The most frequently sampled task was sample collection (n=218, mean=0.40 p.p.m.). Job title and area did not significantly impact task-related exposures. Airborne concentrations were significantly lower after 1990 than before 1990. Results of this task-focused study may be useful when analyzing benzene exposures at other refineries.

Keywords: benzene, refineries, exposure assessment, industrial hygiene.