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Investigation of phthalate emissions from incense stick, scented candle and perfume through a chamber experiment

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Phthalate exposure has been rampant with the growing use of these compounds in personal care and other plastic products. Phthalates have been associated with endocrine, neurological, and reproductive disorders resulting from their continuous release from plastic surfaces throughout their lifecycle. These endocrine disruptors are used in personal care products to increase their shelf life. This paper aims to identify phthalates and their concentration in three test materials, perfume, scented candles, and incense sticks, through a chamber experiment. This experiment aids in understanding phthalate emissions into air during the use of these materials in indoor environments. Sampling was performed using Tenax TA tubes, which were placed inside the glass chambers for 30 minutes while maintaining a positive flow rate using a mass flow controller and pump. The tubes capture gas-phase phthalates efficiently. The tubes were then further analyzed using TD-30 and GC/MS. Three phthalates, which were detected in the test materials, were dimethyl phthalate (DEP), dibutyl phthalate (DBP), and butyl benzyl phthalate (BBP). The phthalate concentration was found to be high in incense sticks, with DEP being the most prominent phthalate, followed by DBP. Scented candles had the high concentration of DBP, followed by BBP. A similar pattern was observed in perfumes. The high concentrations of these compounds detected in the test materials underscore growing concerns about the widespread use of phthalates in manufacturing of plastic products.