Biosolids incubation method for odorous gas measurement from dewatered sludge cakes

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ABSTRACT
In order to compare the odor potential of wastewater biosolids from individual dewatering technologies, a laboratory batch-test was developed that simulates the anaerobic incubation conditions in a sludge tank or cake pile, scaled down to a bottle sized test vessel. The method controls the quantity, incubation time and temperature of biosolids in the vessels, and analyzes the static headspace gases for the odor causing gas concentration. The odor concentration of an incubated specific biosolids sample is reproducible and robust to changes in vessel size and biosolids quantity, as long as the biosolids volume occupies 20% or more of the bottle volume. Incubation of digested cakes at 22°C in closed bottles to simulate non-aerated piles showed that cakes first produced volatile organic sulfide (VOS) odorants to a peak odor level that is highly specific for each dewatering technology. After peaking, VOC gases were consumed, usually within three additional weeks of incubation.