Odor generation patterns from anaerobically digested biosolids


ABSTRACT
Dewatered sludge cakes from anaerobic digesters were evaluated for the amount, type and pattern of odorous gas production using the headspace analysis method developed at Virginia Tech (Novak, et al., 2002). All but one of the sludges was from mesophilic anaerobic digesters. One was from a thermophilic anaerobic digester. The pattern and quantity of sulfur gases was found to be unique for each of the samples with regard to the products produced, the rate of production and the rate of consumption. The main odor causing chemicals were volatile sulfur compounds (VSCs) that included hydrogen sulfide (H2S), methanethiol (MT), dimethyl sulfide (DMS) and dimethyl disulfide (DMDS). In most cases, methanethiol was the major gas emitted, but there were notable exceptions. VSC production tended to peak in 5 to 8 days and then decline. The decline was thought to be due to conversion to sulfide by methanogenic organisms. Where sufficient iron was present, the sulfide would disappear as a result of precipitation by iron. When iron was lacking, H2S accumulated.