Monsanto

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SUBJECT H_2S from MCS-1238 Decomposition

REFERENCE

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Ralph Munch has run several experiments on MCS-1238 decomposition. One type of experiment involved decomposition in a sealed glass tube; the second, decomposition of a capacitor. In the first case the MCS-1238 was taken to 250°C. Decomposition products included water, H_2S and polysulfones. No quantitative breakdown composition was measured. However, if all the sulfur were converted to H_2S, one could make the following calculation:

Assume - 1 oz in capacitor and 10' x 10' x 10' room

$$(28.3 \text{ gm } 1238)\left(0.234 \frac{\text{gm TXS}}{\text{gm } 1238}\right)\left(\frac{34 \text{ gm } H_2S}{260 \text{ gm TXS}}\right) = 0.870 \text{ gm } H_2S$$

$$\frac{1000 \text{ ft}^3}{359 \text{ ft}^3/\text{lb mol}} = 2.79 \text{ lb mol air} = 1260 \text{ gmol air}$$

or 36,600 gm air

$$\text{ppm } H_2S \text{ in air (by wt)} = \frac{0.87}{36{,}600} \times 10^6 = \underline{23.8 \text{ ppm}}$$

An estimate of sulfur as H_2S to polysulfones is about 1/10 in the experiment resulting in an estimated ppm of H_2S in air in our previous calculation of 23.8/10 = 2.38 ppm.

In case two when an actual capacitor was broken down, no H_2S was detected. The difference between the two cases (sealed glass and actual capacitor) is the type of atmosphere existing during breakdown. In the case of the sealed glass, there was a reducing atmosphere, i.e., lack of oxygen; consequently, some H_2S was formed. In the case of the actual capacitor breakdown under ambient conditions, the presence of oxygen resulted in SO_2 formation instead.

Our conclusion is that H_2S formation will not be a problem.

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