Answer on #63214, Chemistry / General Chemistry

What is the maximum mass of S8 that can be produced by combining 76.0 g of each reactant? 8SO2 16H2S yield 3S8 16H2O?

Calculation:

$$8SO_2 + 16\,H_2S \rightarrow 3S_8 + 16H_2O$$

$$\nu(SO_2) = \frac{m}{8 \cdot Mr(SO_2)} = \frac{76g}{8 \bullet 64} = 0.148\ mol - \text{excess}$$

$$\nu(H_2S) = \frac{m}{16 \cdot Mr(H_2S)} = \frac{76g}{16 \bullet 34} = 0.140\ mol - \text{deficiency}$$

by the use of the deficiency, we calculated the mass of S_8

so $m(S_8) = \frac{m(H_2S) \bullet (3 \cdot Mr(S_8))}{16 \cdot Mr(H_2S)} = \frac{76 \cdot 768}{544} = 107.29g$

Answer: 107.29 g S_8 is produced