

Answer on the question #61939, Chemistry / General Chemistry

Question:

Gold is measured in troy ounces, one of the units of apothecaries' weights. In this system of weights, 1 scruple is 20 grains (exactly), 1 ounce is 480 grains (exactly), 1 ounce is 31.103 g, and 12 ounces equals 1 (troy) pound. How many scruples of gold are needed to make a ring weighing 3.77g.

Solution:

Firstly, let's convert grams to ounces:

$$m = 3.77 \text{ g} = 3.77 \text{ g} \cdot \frac{1}{31.103 \left(\frac{\text{g}}{\text{ounce}}\right)} = 0.1212 \text{ ounces}$$

Then, we convert ounces to grains:

$$m = 0.1212 \text{ ounces} = 0.1212 \text{ ounces} \cdot 480 \left(\frac{\text{grain}}{\text{ounce}}\right) = 58.18 \text{ grains}$$

And finally, we convert grains to scruples:

$$m = 58.18 \text{ grains} = 58.18 \text{ grains} \cdot \frac{1}{20 \left(\frac{\text{grain}}{\text{scruple}}\right)} = 2.91 \text{ scruples}$$

Answer: 2.91 scruples ~ 3 scruples