Answer on Question #65669 - Chemistry - General Chemistry

Question: A density measurement was conducted on a sample of cow bone, which had a theoretical density of 1.85 g/ml. The bone had a mass of 18.65 g. When the sample of cow bone was placed in a 30.2 ml volume of water, the water level rose to 41.0 ml. Show the calculation of the density. Show the calculation of the percent error based on the theoretical density of 1.85 g/ml.

Solution

1) Find the volume of the bone sample (it will be equal to the change of the water level):

$$V(bone) \qquad V(wa \quad r)$$

2) Find the experimental density of the bone sample:

$$(bone) \quad \frac{m(bone)}{V(bone)} \quad \text{\_\_\_\_}$$

3) The percent error of the calculated value relative to the theoretical value is calculated by the formula

$$\frac{|e \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad e|}{}$$

So, in our case we have

$$\frac{|1 \qquad\qquad 85|}{}$$

Answer: the calculated density of bone sample is 1.73 g/ml, the percent error is 6.49%.