

Question #59637, Chemistry / General Chemistry

A rice sample was analyzed as received for the total arsenic content by the method of Raber et al., in which a 250 mg sample is dissolved in 10 mL of solution, which was then analyzed by ICP-MS. The solution contained $5.6 \mu\text{g L}^{-1}$ of arsenic. In a separate experiment the moisture content of the rice was determined to be 12%. What was the concentration of arsenic on a dry weight basis in $\mu\text{g kg}^{-1}$?

Solution:

Dry content of the rice: $100\% - 12\% = 88\%$;

Weight of dry basis: $250 \text{ mg} \cdot 88\% = 220 \text{ mg} = 22 \cdot 10^{-5} \text{ kg}$;

Weight of arsenic: $5.6 \mu\text{g L}^{-1} \cdot 10 \text{ mL} = 0.056 \mu\text{g}$;

Concentration of arsenic on a dry weight basis: $0.056 \mu\text{g} / 22 \cdot 10^{-5} \text{ kg} = 254.54 \approx 250 \mu\text{g kg}^{-1}$

Answer:

$250 \mu\text{g kg}^{-1}$