9) In a study of the poisoning of fish, 0.500 g of samples of fish tissue were analysed for barium. Each sample was digested with a permanganate-sulfuric acid mixture, and the volume adjusted to 10 mL and to construct calibration curve, 0.500-g samples of uncontaminated fish tissue were injected with various amounts of Ba^{+2}, and corresponding absorbance as follows:

Standard 0: 0.00 µg Ba^{+2}; 0.015

Standard 1: 50 µg Ba^{+2}; 0.220

Standard 2: 100 µg Ba^{+2}; 0.415

Standard 3: 150 µg Ba^{+2}; 0.602

If all samples and standards were treated in identical manner, what was the concentration of barium (in µg Ba per g of fish) in a fish sample whose absorbance value was 0.421 and 0.378, respectively?

Answer:

From the data provided calibration curve must be built.

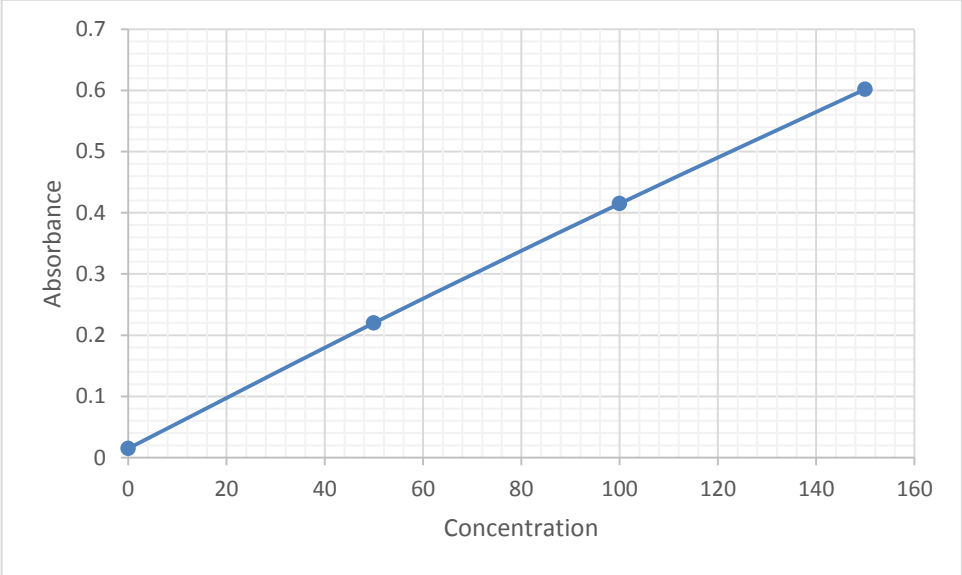

Figure 1 – Calibration curve for Ba^{+2} test

According to this curve, absorbance value 0.421 corresponds to Ba^{+2} concentration 100 µg.
That is why, Ba^{+2} concentration in the fish sample is: 100/0.500 = 200 µg/g of fish tissue.

Absorbance value 0.378 corresponds to Ba^{+2} concentration 86 µg.
That is why, Ba^{+2} concentration in the fish sample is: 86/0.500 = 172 µg/g of fish tissue.