

### Answer on Question #62984 - Chemistry | General Chemistry

In the laboratory you dissolve 20.3 g of aluminum iodide in a volumetric flask and add water to a total volume of 500 mL.

1) What is the molarity of the solution? M.

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2) What is the concentration of the aluminum cation? M.

3) What is the concentration of the iodide anion? M.

#### Solution

$$m(\text{AlI}_3) = 20.3750 \text{ (g)}$$

$$M(\text{AlI}_3) = 407.69523 \text{ (g/mol)}$$

$$n(\text{AlI}_3) = \frac{m}{M} = \frac{20.3750 \text{ g}}{407.69523 \text{ g/mol}} = 0.050367 \text{ (mol)}$$

$$1) C(\text{solution}) = \frac{n}{V} = \frac{0.050367 \text{ mol}}{0.5050 \text{ L}} = 0.10734 \text{ (mol/L) or M}$$



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$$2) C(\text{Al}^{3+}) = 0.1 \text{ (mol/L) or M}$$

$$3) C(\text{I}^-) = 3 \cdot 0.1 = 0.3 \text{ (mol/L) or M}$$

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Since potassium hydrogen phthalate and NaOH react 1:1, the moles of NaOH required for neutralization of the potassium hydrogen phthalate is 0.0734 (mol/L):



$$C_{\text{NaOH}} = \frac{0.00367 \text{ mol}}{0.03601 \text{ L}} = 0.1019 \left(\frac{\text{mol}}{\text{L}}\right) \approx 0.1 \text{ M}$$

#### Answer

The molarity of the solution 0.1 M

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The concentration of the aluminum cation 0.1 M. Molarity of the sodium hydroxide solution is 0.1 M.

The concentration of the iodide anion 0.3 M