

**DETERMINATION OF ARSENIC IN ACID MINE DRAINAGE AND RIVER
WATER IN RANAU, SABAH**

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ABSTRACT

The colorimetric analysis of arsenic (As) in aqueous solution according to the molybdenum blue method was investigated. Maximum absorbance reading can be obtained at $\lambda=880$ nm at least 20 minutes after addition of molybdate reagent to the arsenate, As(V) solution. The absorbance-concentration relationship obeyed the Beer-Lambert law at low arsenate concentrations ($\leq 5 \mu\text{g mL}^{-1}$) but showed a negative deviation at high ($>5 \mu\text{g mL}^{-1}$) concentrations. At fixed arsenate concentration, the presence of phosphate ion gave a higher absorbance reading, which increased with the increase in phosphate concentration. Analysis of river water and acid mine drainage (AMD) samples gave total As concentration in the range of $0.013\text{-}0.019 \mu\text{g mL}^{-1}$ (Mean= $0.016\pm 0.003 \mu\text{g mL}^{-1}$) and $0.012\text{-}0.024 \mu\text{g mL}^{-1}$ (Mean= $0.017\pm 0.005 \mu\text{g mL}^{-1}$), respectively. These values are higher than the WHO guideline value ($0.01 \mu\text{g mL}^{-1}$) for arsenic concentration in water. Arsenite, As(III), and arsenate, As(V), is dominant in river water and AMD, respectively.

