INTERFERENCE STUDIES IN GERMANIUM DETERMINATION
BY ETA-AAS

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Determination of Ge in chloride containing samples by ETA-AAS is very difficult, due to the formation of volatile GeCl₄ and the appearance of very high background signal of NaCl.

In order to volatilize chloride from the sample matrix during the drying and/or ashing steps of the atomizer, the following compounds were tried as volatilizing agents, namely, ammonia, nitric acid, and ammonium nitrate.

Unfortunately, ammonia was not useful as a volatilizing agent because, it was evaporating during the drying step. However, at high ammonia concentration (5 M), the enhancement factor for Ge signal was higher compared with that, when Ni(NO₃)₂ alone was used as a matrix modifier.

Different concentrations of nitric acid were used to study the volatilization of chloride from the matrix. The background absorptions were measured at Ge line for 1000, 2000, and 3000 mg/L NaCl. 0.2 M HNO₃ satisfactorily depressed the background signal raised from different concentrations of NaCl. At the same time, the NaNO₃ formed due to the reaction between NaCl and HNO₃ stabilized Ge, probably by forming stable sodium germanate and hence, the Ge signal is enhanced.

The effect of different ammonium nitrate concentrations on background absorption of 1000, 2000, and 3000 mg/L NaCl were studied and 0.1 M ammonium nitrate was found to be sufficient to depress the background signal.