

AMMONIUM HYDROXIDE

SCA-227 (4/86)

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INSTRUMENT: NUSONICS™ CONCENTRATION ANALYZER

INDUSTRIES: FERTILIZERS, CHEMICAL PROCESSING

APPLICATION: MEASUREMENT OF AMMONIUM HYDROXIDE CONCENTRATION

INTRODUCTION

Ammonia (NH_3) dissolves in water to form ammonium hydroxide (NH_4OH). The concentration of ammonium hydroxide is reported as $\% \text{NH}_3$ or as $\% \text{NH}_4\text{OH}$. For purposes of this bulletin, concentration will be reported as $\% \text{NH}_3$.

TEST CONDITIONS

Ammonium hydroxide solutions with ammonia concentrations of 0-28% by weight NH_3 have been tested for temperatures of 20°C to 30°C at ambient pressure.

RESULTS

Figures 1 and 2 show the variation of sound velocity with concentration and temperature. As illustrated in Figure 3, for concentrations of 1 to 12% NH_3 , the accuracy of measurement is between ± 0.056 and $\pm 0.023\% \text{NH}_3$. The accuracy is between $\pm 0.023\%$ and $\pm 0.063\%$ for ammonia concentrations of 12 to 28%.

DISCUSSION

Concentration of ammonium hydroxide solution can be monitored continuously thus eliminating laborious and time consuming methods like titration. A gravitometer would have to be extremely accurate in its specific gravity measurement to be able to match the repeatability of a sonic analyzer. For example, to provide equivalent resolution of changes in concentration, as compared to the NUSONICS Analyzer, a gravitometer would have to provide a repeatability of 0.000017 specific gravity units.

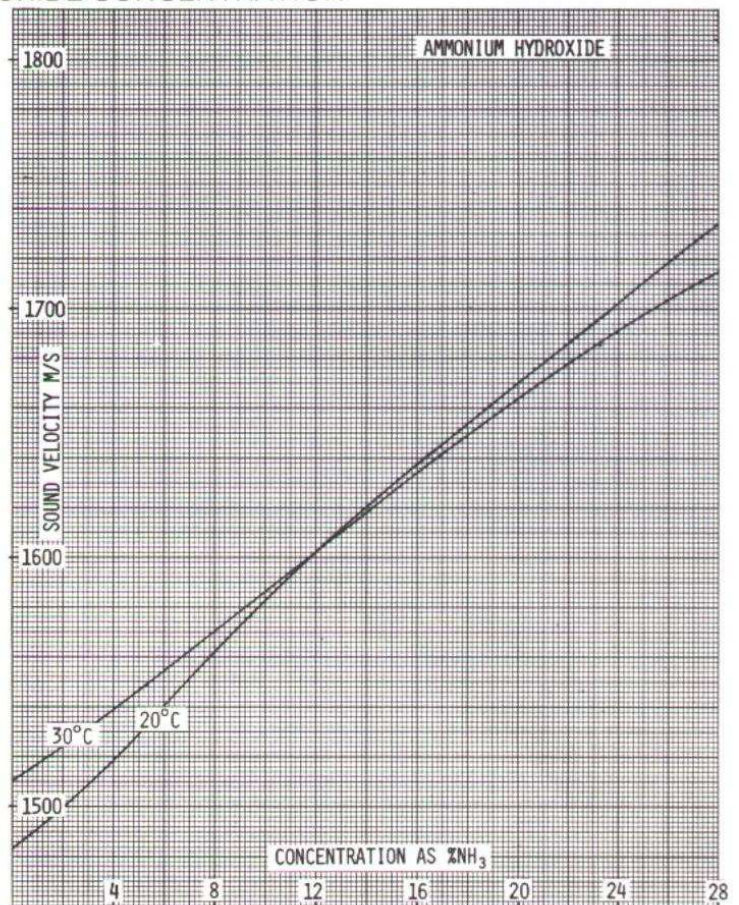


Figure 1.

CONCLUSION

Because of its speed of response, high accuracy and low maintenance, the NUSONICS Concentration Analyzer is very suitable for measurement of ammonia concentration. The analyzer is capable of measuring NH_3 concentration within about $\pm 0.05\%$, over a wide range of concentrations.

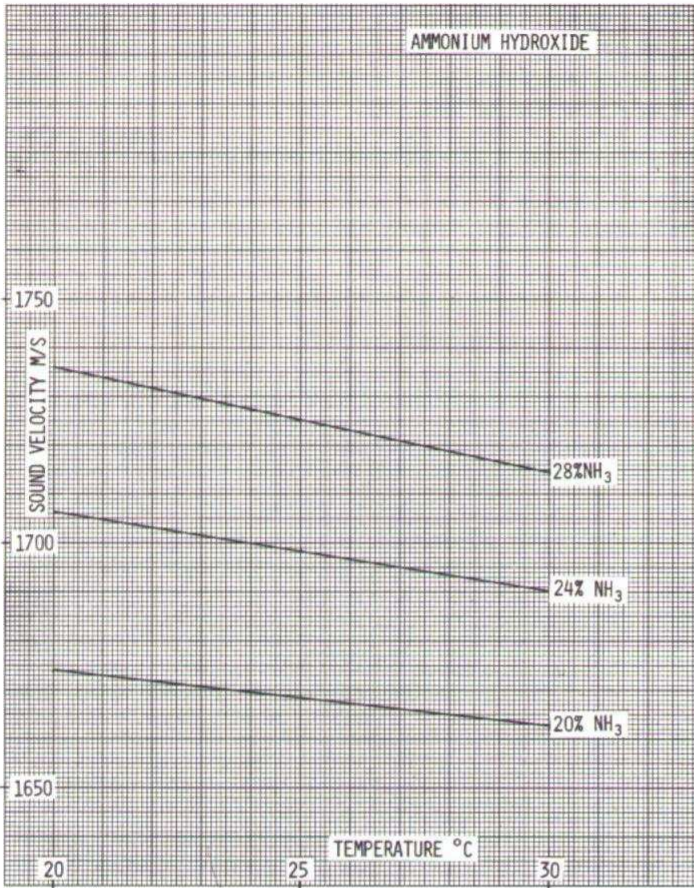


Figure 2.

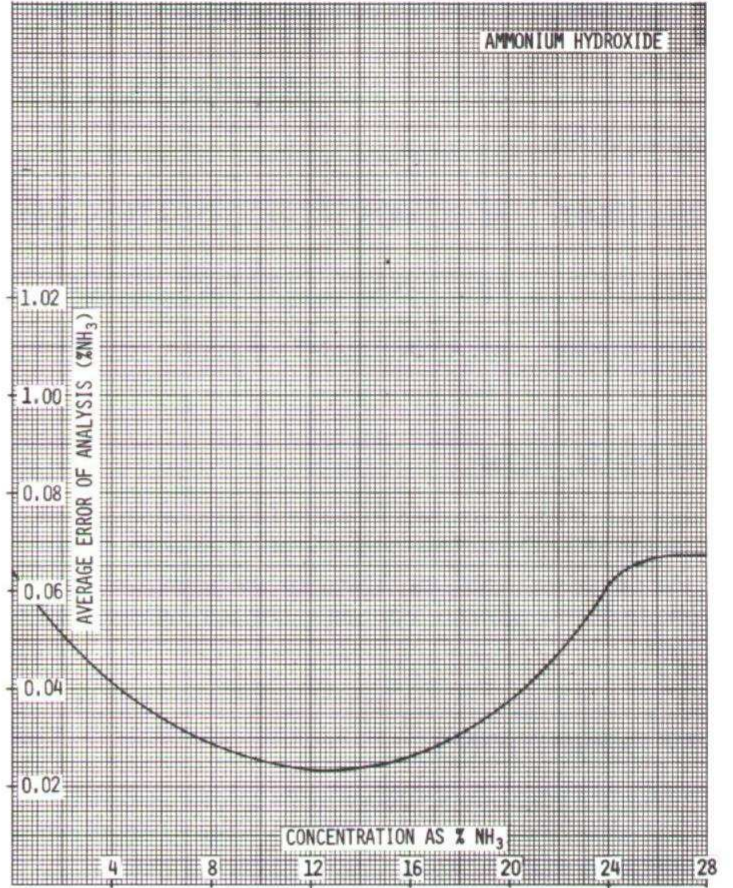


Figure 3.