

3. CURRY, R. C. & MELLON, M. G., *Analyt. Chem.*, **28** (1956), 1567.
4. SZABÓ, Z. G., BECK, M. T. & TOTH, K., *Mikrochim. Acta*, (1958), 181.
5. UEDA, I., *Shika Igaku*, **32** (1969), 726; *Chem. Abstr.*, **73** (1970), 51984.
6. YTSIMIRSKII, K. B. & VASILEV, V. P., *Instability constants of complex compounds* (Van Nostrand, Princeton, New Jersey), 1960, 130.

### Manganese(IV) as an Analytical Reagent for Determination of Tellurium

S. BHANOJEE RAO & B. R. SANT\*  
Regional Research Laboratory, Bhubaneswar

Received 19 April 1980; revised and accepted 6 June 1980

A simple and rapid method for the estimation of tellurite using excess manganese(IV) sulphate solution is reported. Manganese(IV) is reduced to manganese(III) and the excess of the reagent is titrated with standard iron(II) solution.

TELLUROUS acid and tellurites are not easily oxidised and most of the methods for their estimation are very old and involve addition of excess oxidant and back titration. Recently Mandal and Sant<sup>1,2</sup> reported the preparation and utilization of manganese(IV) sulphate as an oxidant. Our preliminary experiments revealed that Te(IV) is completely oxidised to Te(VI) in sulphuric acid medium.

Manganese(IV) sulphate solution was prepared and standardised as described earlier<sup>1</sup>. For the preparation of tellurite solution, potassium tellurite was dissolved in 0.01 N potassium hydroxide and standardised with ceric sulphate.

All other reagents used were of AR grade.

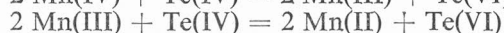
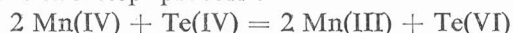
TABLE 1 — ESTIMATION OF TELLURITE

Sulphuric acid molarity	Tellurite(M)	
	Taken	Found
6	0.07144	0.07144
8	0.07144	0.07144
10	0.07144	0.07144
12	0.07144	0.07144
14	0.07144	Erratic
16	0.07144	Erratic
10	0.1169	0.1169
10	0.1754	0.1754
10	0.05845	0.0584

*Procedure*—To an aliquot of tellurite solution sulphuric acid was added to maintain an overall molarity of 8-10. To this was added a known excess of manganese(IV) sulphate solution. After 15 min at room temperature the excess oxidant was titrated with standard iron(II) solution using ferroin as indicator. One millilitre of 0.1 N Mn(IV) sulphate solution corresponds to 6.38 mg tellurium.

Typical results for the estimation of tellurium are given in Table 1.

The oxidation of tellurium(IV) by manganese(IV) is a two step process :



The first reaction is complete within 5-10 min at ambient temperature and the second reaction is slow and is not complete even after 6 hr. However, when excess of manganese(IV) is present only the first reaction takes place enabling the precise estimation of Te(IV). The principal advantage of the method is its simplicity and accuracy.

#### References

1. MANDAL, S. K. & SANT, B. R., *Talanta*, **23** (1976), 485.
2. MANDAL, S. K. & SANT, B. R., *Indian J. Chem.*, **19A** (1980), 389.