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SHORT COMMUNICATION

Electrical Conductivity of Silver Metavandate

K. TENNAKONE
Department of Physics, University of Ruhuna, Matara, Sri Lanka

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Vandates and mixed oxides of vanadium have interesting electrical transport properties. In this note we report our observations on temperature variation of the electrical conductivity of silver metavandate.[3] Silver metavandate ($AgVO_3$) is prepared by the following method.[1] Silver nitrate solution is added to a solution of ammonium metavandate. An impure form of silver metavandate is precipitated. To purify, the precipitate is dissolved in ammonia solution and dilute acetic acid is added, when silver metavandate is reprecipitated. The purified compound, when dried is orange-red in colour and stable up to $\sim$ 250°C.

To measure conductivity the powder is compacted between carbon electrodes in a pyrex tube (diameter $\sim$ 0.5 cm, pellet length $\sim$ 0.3 cm) at a pressure of $\sim 10^6$ Pa and the conductivity at different temperatures is measured with a conductivity meter. Current voltage characteristics are linear and the conductivity is found to vary with temperature (Figure 1) according to the law,

$$\sigma = \sigma_o e^{-E/kT} \qquad (1)$$

with activation energy $E = 0.28\ eV$ and $\sigma o = 0.127\ \Omega^{-1}m^{-1}$.

There is no evidence for ionic conduction[2] in silver metavandate. We have not been able to determine the mobilities of the charge carriers (electrons or holes). The crystal structure of silver metavandate is not reported in literature to the knowledge of the authors.

References

1. DURRANT, P. J. (1977). *Introduction to Advanced Inorganic Chemistry*, Longman.
2. INOKUCHI, H. (1965). *Electrical Conduction in Solids*, Routledge S. Kegan Paul, London.
3. MOTT, N. F. & DAVIS, E. A. (1979). *Electronic Processes in Non-crystalline Materials* Clarendon Press, Oxford.

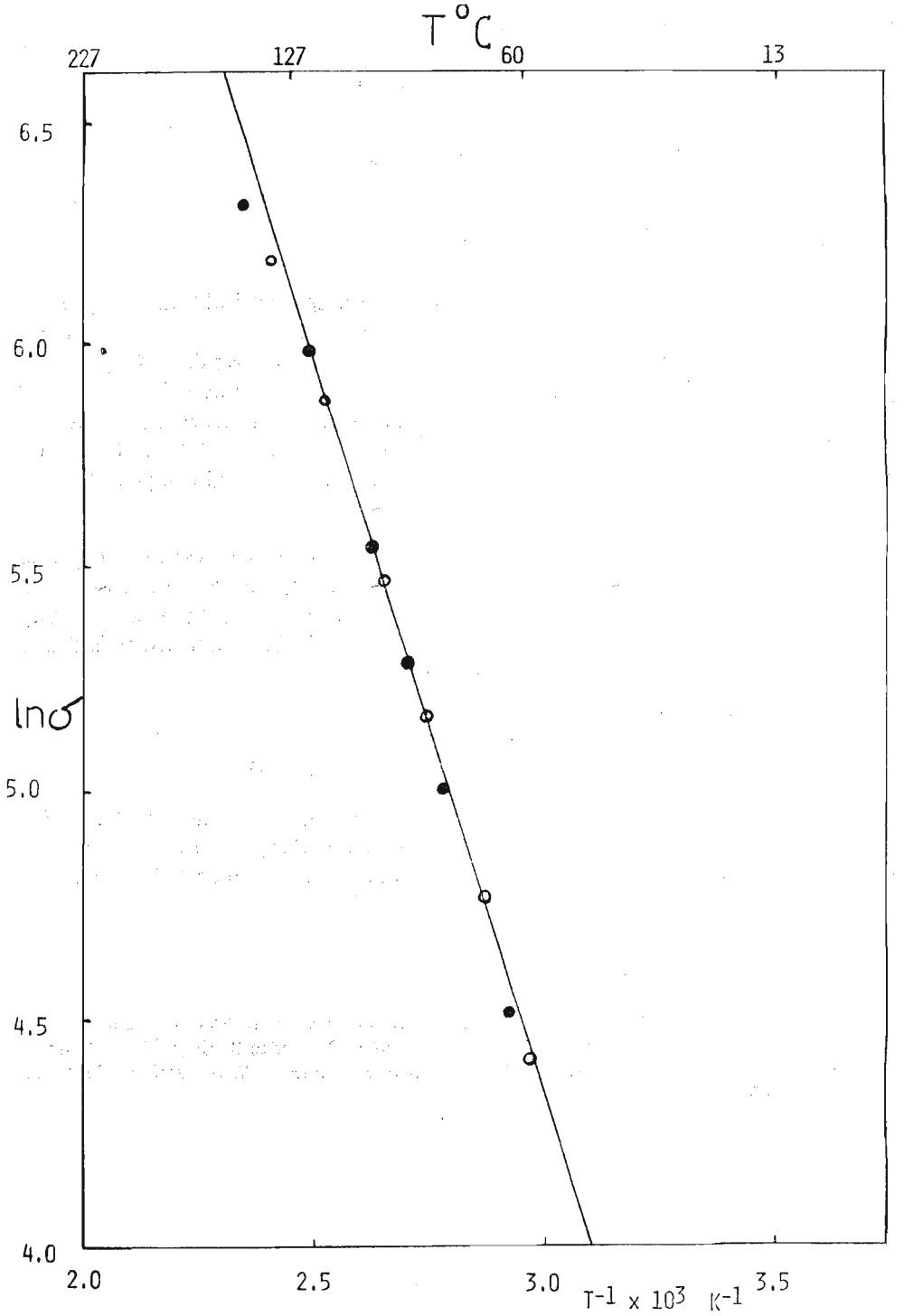

Figure: 1 The plot of ln σ(σ in Ω^{-1} m^{-1}) vs T^{-1} (T^{-1} in $^{o}K^{-1}$)
o — heating ● — cooling