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REFERENCES

- BENGUS (V. Z.), LAVRENTEV (F. F.), SOIFER (L. M.), and STARTSEV (V. I.) [Бенгус (В. З.), Лаврентьев (Ф. Ф.), Соифер (Л. М.), и Старцев (В. И.)], 1960. *Soviet Physics (Crystallography)*, **5**, 418 (trans. of Кристаллография), **5**, 441.
HONESS (A. P.), 1918. *Amer. Journ. Sci. ser. 4*, **45**, 201.
KEITH (R. E.) and GILMAN (J. J.), 1960. *Acta Metall.* **8**, 1.
PANDYA (N. S.) and PANDYA (J. R.), 1961. *Journ. Maharaja Sayajirao Univ., Baroda*, **10**, 21.
PFEFFERKORN (G.), 1952. *Neues Jahrb. Min., Abh.* **84**, 281 [M.A. 12-89].

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The melting points of synthetic apatites

THE melting points of six synthetic apatites were determined with a hot-stage microscope. The construction and operating principles of this apparatus have been described by Somer *et al.* (1964, 1966).

The sample weight used for the determination was between 100 and 200 g; it was first ground to a fine powder in a small agate mortar and mixed with a drop of ethyl alcohol to form a thick slurry, which was then transferred to the thermocouple; this was made of a Pt-6 %Rh-Pt-30 %Rh alloy, a combination chosen for its excellent temperature-emf characteristics. The melting points were all determined in air by two workers, and the thermocouple used throughout the investigation was checked at the liquidus temperature of lithium sulphate, 865 °C. The result obtained confirmed that no 'poisoning' of the thermocouple had occurred, and the melting points are accurate to within ± 5 °C. The temperature gradient, observed in the sample at the melting point, was about 5 °C at 1600 °C.

The results obtained were: $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$, 1614, 1614 °C; $\text{Ca}_{10}(\text{PO}_4)_6\text{Cl}_2$, 1612, 1612 °C; $\text{Ca}_{10}(\text{PO}_4)_6\text{F}_2$, 1615, 1622 °C; $\text{Ca}_{10}(\text{PO}_4)_6\text{F}_{0.554}\text{Cl}_{1.446}$, 1615, 1614 °C; $\text{Ca}_{10.4}(\text{PO}_4)_6\text{F}_{1.449}\text{Cl}_{0.579}$, 1608, 1608 °C; $\text{Sr}_{10}(\text{PO}_4)_6(\text{OH})_2$, 1670, 1670 °C.

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REFERENCES

SOMER (G.) and MILLER (R. P.), 1964. *Govt. Metal. Lab. South Africa*, Proj. C. 46/64, Rept. 1.
—, FAURE (P. K.), and STEELE (T. W.), 1966. *Nat. Inst. Metal. South Africa*, Rept. 67.

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