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STEP

AUTHORS: Gel'd, P.V., Matveyenko, I.I., and Alyamovskiy, S.I.

TITLE: Intermediate products in the process of reduction of vanadium oxides by carbon

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no.5, 1962, 59-69

TEXT: The kinetics of the reduction of vanadium oxides by carbon have received little attention. Highly pure vanadium has good mechanical and corrosion resistance properties and there are good prospects for the industrial application of vanadium carbides and oxycarbides. The kinetics of the reduction of V_2O_3 was investigated between 1100 and 1600°C. The reduction is not

Card 1/3

Intermediate products in the process of...

a single reaction because, while its initial stage depends on the rate of gasification of carbon, on the absorption or chemical processes and on crystallographic changes taking place in the reduced oxides, the final stage depends on the velocity of diffusion of atoms of O, C, and V through the lattices of oxides and particularly oxycarbides. The first product consists of an intermediate oxycarbide δ - phase which can be transformed either into an ξ - phase or into an intermediate γ - phase, depending on the composition of the charge, on the nature of the reducing agent, and on the temperature. The reduction of higher oxides V_2O_5 and VO_2 by carbon below 800°C leads to the formation of the V_6O_{13} -, VO_2 -, V_3O_5 -, and V_2O_3 - phases. No intermediate $VO_{1.87}$, $VO_{1.86}$, $VO_{1.84}$, $VO_{1.80}$ and $VO_{1.75}$ phases have been found. There is 1 figure and 4 tables.

Card 2/3

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