

**Reduction potential and oxidation catalysis of
vanadium-containing heteropolyacid (HPA) catalysts**

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Heteropolyacids (HPAs) have attracted much attention as homogeneous and heterogeneous catalysts for oxidation reactions. In general, it is known that the vanadium-containing HPAs have a strong oxidizing power (high reduction potential). The reduction potential of vanadium-containing $H_6+xP_2Mo_{18-x}V_xO_{62}$ ($x=0, 1, 2,$ and 3) Wells-Dawson HPA and $H_3+xPMo_{12-x}V_xO_{40}$ ($x=0, 1, 2,$ and 3) Keggin HPA catalysts was measured by TPR experiments. The dehydrogenation of cyclohexanol was carried out to investigate the catalytic performance of the vanadium-containing HPA catalysts. Both reduction potential and catalytic activity showed a volcano-shaped curve with respect to vanadium substitution, across both families of HPA catalysts. The Wells-Dawson HPA showed a better catalytic performance than the Keggin HPA at the same level of vanadium substitution. A correlation between catalytic activity and reduction potential of the HPA catalysts was well established (KOSEF R01-2004-000-10502-0).