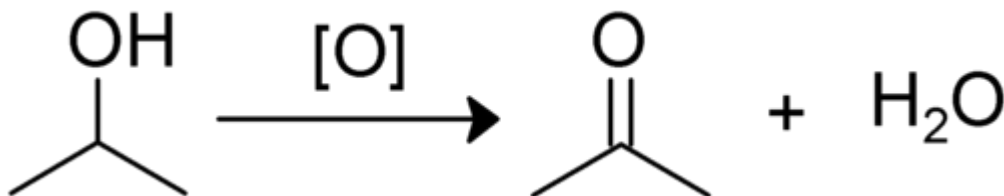


Oxidation of secondary alcohols to ketones

The **oxidation of secondary alcohols to ketones** is an important oxidation reaction in organic chemistry.



Where a secondary alcohol is oxidised, it is converted to a ketone. The hydrogen from the hydroxyl group is lost along with the hydrogen bonded to the second carbon. The remaining oxygen then forms double bonds with the carbon. This leaves a ketone, as R₁–COR₂. Ketones cannot normally be oxidised any further because this would involve breaking a C–C bond, which requires too much energy.^[1]

The reaction can occur using a variety of oxidants.

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Potassium dichromate

A secondary alcohol can be oxidised into a ketone using acidified potassium dichromate and heating under reflux. The orange-red dichromate ion, Cr₂O₇²⁻, is reduced to the green Cr³⁺ ion. This reaction was once used in an alcohol breath test.

PCC (Pyridinium chlorochromate)

PCC, when used in an organic solvent, can be used to oxidise a secondary alcohol into a ketone. It has the advantage of doing so selectively without the tendency to over-oxidise.

Dess–Martin oxidation

The Dess–Martin periodinane is a mild oxidant for the conversion of alcohols to aldehydes or ketones.^[2]

3. J. S. Yadav, et al. "Recyclable 2nd generation ionic liquids as green solvents for the oxidation of alcohols with hypervalent iodine reagents", *Tetrahedron*, **2004**, *60*, 2131–35

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