

SOME OXIDIZING AGENTS IN ORGANIC CHEMISTRY

	alkane	alkene	alkyne	aromatic	benzyl or allyl	alkyl halide	alcohol p or s	ether p or s	Aldehyde	ketone	amine	organo-metallic	sulfide
H ₂ CrO ₄		+	+		+		+	+	+				?
CrO ₃ , Py (PCC)		+	+ ?		+		+		-	-			?
CrO ₂ Cl ₂					+		+		-	-	+		+
KMnO ₄ , OH ⁻		+	+	+ (heat)	+		+	+	+	+ (CH ₃)	+		+
KMnO ₄ , H ⁺							+		+				
Cl ₂ , Br ₂ , I ₂	+	+	+	+ (Fe)	+	+	+		+	+ (αCH)	+	+	?
NBS					+		+		+ (αCH)	+ (αCH)			
RCO ₃ H		+	+				+		+	+	+	+	+
HOOH		+	?	+ (FeSO ₄)					+	+ (αCH)	+	?	+
O ₂	+ (tert)	+ (light)	+ (light)	+	+ (light)			+ (light)	+ (slow)		+	+	+
O ₃		+	+	+				+				+	+
HNO ₃				+ (H ₂ SO ₄)	+		+		+	+			+
HNO ₂				+ (H ₂ SO ₄)			+		?				
SO ₃				+ (H ₂ SO ₄)					+	+			
OsO ₄		+	+										+
NaIO ₄		?	?				+ (diol)						+
Pb(OAc) ₄		+					+ (diol)	+		+	+		
Ag(NH ₃) ₂ ⁺ , Ag ₂ O									+				
Cu ⁺⁺ (Fehling)									+				
Pt (or Pd)	+ (-H ₂)						+ ?(-H ₂)				+		
	alkane	alkene	alkyne	aromatic	benzyl or allyl	alkyl halide	alcohol p or s	ether p or s	aldehyde	ketone	amine	organo-metallic	sulfide

Ethers usually form explosive peroxides when oxidized and are nearly as reactive as alcohols. BEWARE!!!

Groups not included are generally not oxidized (e.g. CO₂H)

+ reacts by oxidizing the functional group

- no oxidation

? or + ? expect oxidation but found no examples

A blank space means that information was not readily available or there were examples of + and -; contributions welcome.