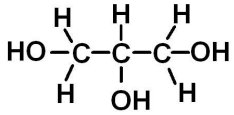
Permanganate Volcano

Oxidation of Glycerol with Potassium Permanganate

See one link below:

http://www.youtube.com/watch?v=Pnt6yAJEghc

Glycerol, also known as glycerin is a trihydroxy alcohol with the structural formula shown:



It is a colorless, odorless and nontoxic viscous liquid which is sweet in taste. Similarly to other alcohols, glycerol can be oxidized with a variety of oxidizing agents. Potassium permanganate is a very strong oxidizing agent and readily oxidizes alcohols to different products, depending on the reaction conditions and the structure of alcohol being used.

When pure glycerol is poured onto a pile of potassium permanganate, white smoke is produced in the beginning. Oxidation of glycerol with potassium permanganate is an exothermic process, heat released in the reaction being enough to cause glycerol to evaporates. As the reaction proceeds, more and more heat is released in the reaction and glycerol is eventually ignited. Because of presence of potassium ions (from potassium permanganate), the flame is violet in color. Although there are lot of reaction pathways and lot of products formed during the combustion, the following equation shows the main process in which glycerol is completely oxidized to carbon(IV) oxide.

$$14\ KMnO_4 + 4\ C_3H_5(OH)_3 \ \text{----------}> \ 7\ Mn_2O_3 + 7\ K_2CO_3 + 5\ CO_2 \ + 16\ H_2O$$

The black residue after the reaction is mostly a mixture of manganese(III) oxide and/or manganese(IV) oxide and potassium carbonate.