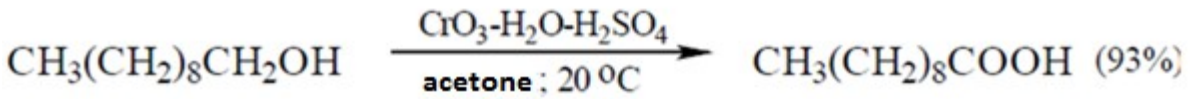
**Answer on Question #61067 - Chemistry – Organic Chemistry**

## Task:

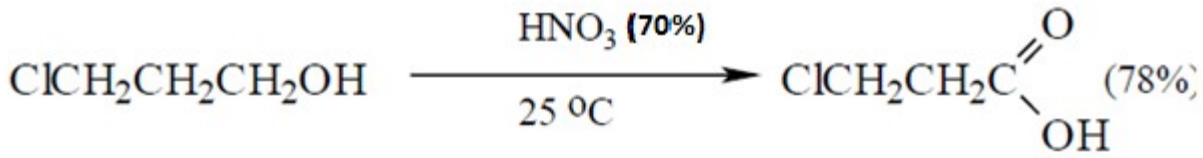
How would you convert the following?:
1) Alcohol to carboxylic acid
2) Aldehyde to carboxylic acid

## Solution:

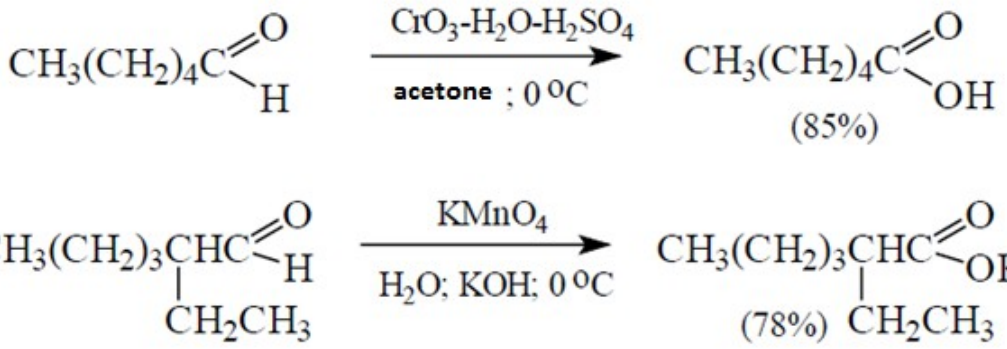
**1)** Primary alcohols are oxidized with Jones reagent (solution strictly calculated amount of $CrO_3$ in aqueous sulfuric acid) to carboxylic acids. Aldehydes undoubtedly are formed as intermediates, but they are quickly oxidized under the action of an oxidant:




In individual and very rare cases, nitric acid is used as a cheap oxidant. In this case both primary and secondary alcohols are oxidized to carboxylic acids:




**2)** The aldehydes are readily oxidized to carboxylic acids by the action of a wide variety of oxidizing agents, among which the most is often used potassium permanganate or Jones reagent. Best results are obtained by Jones reagent. In this case, the oxidation is carried out at 0-20 ° C during a very short time, and carboxylic acids yields exceed 80%:




However, the Jones reagent does not have high selectivity relative to other functional groups, as also acidic environment is sometimes extremely undesirable due to isomerization or destruction. In all such cases, an ideal selective oxidizing agent is an aqueous-alcoholic ammonia solution of silver oxide (Tollens reagent). This reagent does not affect the carbon-carbon double or triple bond, hydroxyl group of alcohols, etc.: