SL & HL Questions on Alcohols

1. State the equations for the complete combustion of:
i. ethanol **ii.** propan-2-ol

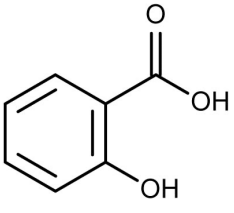
2. Propan-2-ol and propan-1-ol can both be oxidized by a warm acidified solution of potassium dichromate(VI).
i. Describe what would be observed in both cases.
ii. State the IUPAC name of the product from the oxidation of propan-2-ol and state the simplified equation (use [O] to represent the oxygen from the acidified potassium dichromate(VI) solution).
iii. The half-equation for the reduction of the acidified dichromate(VI) ion is:

$$Cr_2O_7^{2-}(aq) + 14H^+(aq) + 6e^- \rightarrow 2Cr^{3+}(aq) + 7H_2O(l)$$

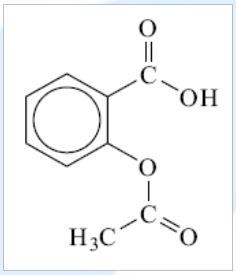
Deduce the full equation for the oxidation of propan-2-ol using acidified $Cr_2O_7^{2-}$ ions.
iv. State the IUPAC name of the two organic products that can be formed when propan-1-ol is oxidized by warm acidified potassium dichromate(VI) solution.
v. Explain why propan-1-ol can form two different organic products whereas propan-2-ol only forms one organic product when oxidized by acidified potassium dichromate(VI) solution.
iv. Describe how you could separate the two organic products formed from the oxidation of propan-1-ol.

3. The precise use of language is important in chemistry. Many books state that tertiary alcohols, such as 2-methylpropan-2-ol, $(CH_3)_3COH$, are not readily oxidized. Evaluate this statement.

4. i. State the equation for the formation of methyl salicylate from the reaction between salicylic acid and methanol.



salicylic acid



aspirin

ii. Aspirin is also an ester that can be formed from salicylic acid. Suggest a possible way in which it could be synthesised starting with salicylic acid.

iii. State the name of salicylic acid according to the IUPAC naming system.