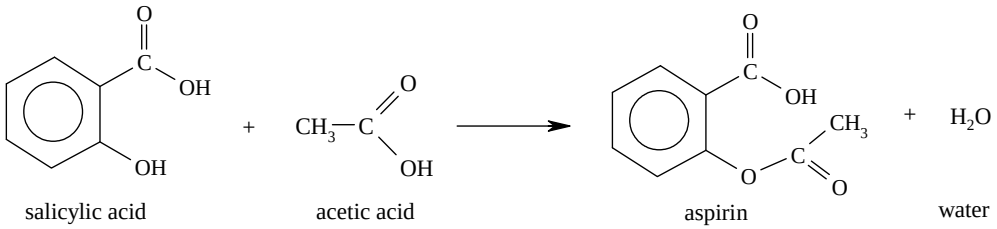
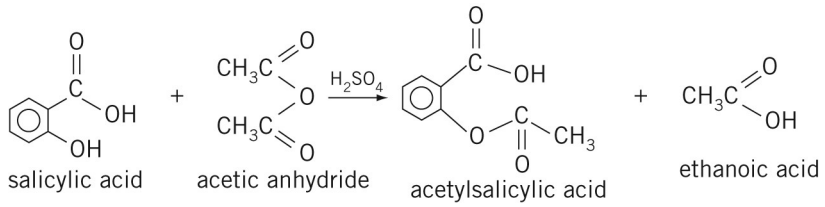
Worksheet 12.3: Solutions

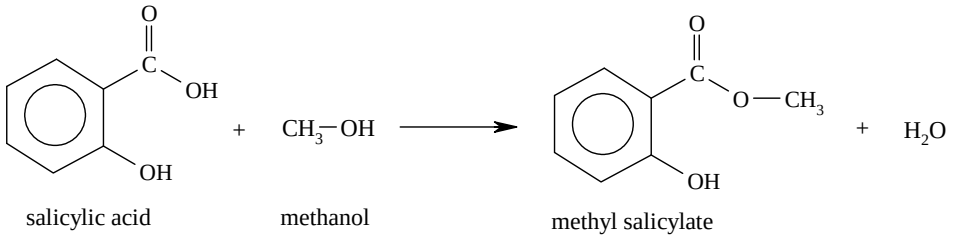
Preparation and analysis of aspirin

No.	Answer
1	Analgesic: pain reliever Antipyretic: reduces fever Anti-inflammatory: reduces production of prostaglandins that lead to inflammation
2	Used by the ancient Greeks and by native Americans, who chewed the leaves.
3	**a** Carboxylic acid **b** Hydroxy (or alcohol) **c** Ester
4	 salicylic acid + acetic acid → aspirin + water
5	 salicylic acid + acetic anhydride (H_2SO_4) → acetylsalicylic acid + ethanoic acid
6	**a** It is a catalyst. **b** It is used in many ester-forming reactions.
7	**a** The binder holds the tablet together so that it is a single, solid tablet. **b** The binder must be harmless, stable and edible – starch is suitable for this.
8	**a** m(acetylsalicylic acid) = 0.325×10^6 mg = 325×10^3 g n(acetylsalicylic acid) = $\frac{m}{M} = \frac{325 \times 10^3}{180.154}$ n(salicylic acid) = n(acetylsalicylic acid) $= n \times M = \frac{325 \times 10^3}{180.154} \times 138 = 249 \times 10^3$ g = 249 kg **b** The process is far from 100% efficient. Reaction is incomplete and isolation of the product is difficult because the solubility of the aspirin makes it hard to crystallise out from the reaction solution.
9	Stomach bleeding may occur. In addition, the blood is thinned too much, making it unlikely to congeal and so interfering with the clotting process.

© Pearson Australia (a division of Pearson Australia Group Pty Ltd).
This page from the *Chemistry for WA 2, Teacher Resource Centre* may be reproduced for classroom use.

Preparation and analysis of aspirin

No.	Answer
10	Methyl salicylate (oil of wintergreen) is produced.



salicylic acid methanol methyl salicylate

© Pearson Australia (a division of Pearson Australia Group Pty Ltd).
This page from the *Chemistry for WA 2, Teacher Resource Centre* may be reproduced for classroom use.