First Semester B. Pharm (2018 Batch)
Examination 2018

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Pharmaceutical chemistry - I

Q-1 What is impurities? Write sources of impurities in manufacturing.

→ A compound is said to be impure if it is having foreign matter that makes the compound impure is called impurities.

→ As such no compound is 100% pure.

Sources of impurities in manufacturing :-

1) Raw material employed in manufacture.
2) Reagent used in manufacturing process.
3) Methods used in process of manufacture.
4) Chemical process used in the manufacture.
5) Atmospheric contamination during manufacturing process
6) Intermediate product in the manufacturing process.
7) Defect in manufacturing process.
8) Manufacturing Hazardous.
9) Storage condition.
10) Decomposition of product during storage.
11) Accidental substitution or deliberate adulteration.

Q-2 Write the procedure of limit test for iron and arsenic.

→ Limit test for Iron (Fe)

Test solution
Sample + 40ml of water + 2ml of 20% w/v citric acid + 2 drops of thioglycollic acid ; solution mixed and made alkaline with ammonia (NH_3) + volume.

Standard solution.
2ml of standard solution of iron (Fe) + 40ml of water + 2ml of 20% w/v citric acid + 2 drops of thioglycollic acid,

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adjusted to 50ml + allowed to stand and colour developed viewed vertically and compared with Standard solution.

solution made alkaline with NH_3 and adjusted to 5ml + allowed to stand and colour developed is compared with test solution.

Limit test for Arsenic (As)

Test - solution

1gm of substance + 1g of KI + 5ml of Stannous Chloride acid solution + 10g of zinc + action allowed to continue for 40 minutes, a yellow stain produced on $HgCl_2$ paper compared with standard stains in daylight.

Standard solution.

Strong arsenic solution having 0.132g of As_2O_3 per 100 ml of solution + 1ml of above solution diluted with water to 100ml + 1ml of which would be having 0.000001g of As.

→ If the sample under investigation shows a stain of lesser intensity than that of the standard, then it passes the test.

0.3 Write the procedure of limit test for chloride and sulphate.

Limit test for chloride (Cl)

Test solution

Specific substance (4g) + 10 ml of water + 1ml of HNO_3 → diluted to 50ml with H_2O

Standard solution

1ml of 0.05845 % w/v solution of NaCl + 1ml of HNO_3 + diluted

+ 1ml of $AgNO_3$ solution → turbidity

to 50ml with H_2O + 1ml of $AgNO_3$ sol. → turbidity

→ If the opalescence from the sample has been less than the standard opalescence, the sample will pass the limit test.

Limit test for Sulphate (SO_4)

Test solution
Specified substance (1g) + 2ml HCl diluted to 45ml + 5ml solution of $BaSO_4$ reagent → turbidity

Standard solution
1ml of 0.108% w/v solution of K_2SO_4 + 2ml HCl + H_2O dilute to 45ml + 5ml solution of $BaSO_4$ reagent → turbidity

→ If the turbidity produced by the test solution has been less than standard turbidity the sample would pass the limit test for sulphate.

Q.4 write short note on acid and bases.

→ 1) Earlier concept of Acid and Base

Acid are defined as any substance which has a sour taste and its aqueous solution turns blue litmus red.

Base are defined as any substance which has a bitter taste and its aqueous solution turns

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red litmus blue.

2) Arrhenius concept

→ Acid may be defined as any hydrogen containing substance which gives H^+ ions in aqueous solution and a base may be as defined as a substance hydroxy groups or groups capable of providing hydroxide ions OH^- in aqueous solution.

3) Bronsted-Lowry concept (Proton-Donor concept)

→ acid → capable of donating a proton H^+ to a base.

Base → capable of accepting a proton H^+ from an acid.

4) Lewis concept (Electron-Donar-Acceptor system)

→ Acid may be defined as any species that can accept electron pair to form a coordinate bond and base may be defined as any species that can donate an electron pair to the formation of a coordinate bond.

5) Hard and soft acid-base concept.

→ Concept given by R.G. Pearson., known as Pearson's HSAB principle.

Q-5 write short notes on buffer.

→ Buffer is a solution that has ability to resist the change in PH value. Two types of buffer solutions are (a) acidic buffer and (b) Basic buffer. The pH of a buffer solution remains constant. It doesn't change on dilution or addition of small quantity of acid or base. PH of acidic buffer solution is determined by Henderson-Hasselbalch equation.

$$pH = pKa + \log \frac{[\text{conjugate base}]}{[\text{acid}]}$$

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