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Estimation of Moisture Content Percentage in Sodium Chloride Using Karl Fischer Apparatus

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Abstract: The Karl Fischer titration method is available for the determination of moisture. The water content in chemicals, drugs and pharmaceuticals can be readily determined by titration with Karl Fischer reagent which contains iodine sulphur dioxide, anhydrous methanol and anhydrous pyridine. The present work showed the estimation of moisture content percentage in sodium chloride using Karl Fischer titration apparatus.

Keywords: Karl Fischer, Sodium Chloride, Moisture.

Introduction

In 1935, Karl Fischer proposed a reagent prepared by the action of sulphur dioxide on solution of iodine in a mixture of anhydrous pyridine and anhydrous methanol or another suitable solvent [1]. The reagent decomposes on standing, hence should be standardized frequently. For aldehyde and ketones, specifically formulated reagents are available commercially [2].

Materials and Methods

Materials: A EI Karl Fischer titremetric apparatus (Model, 761E, automatic) with dual platinum electrode was used for accurate determinations of moisture content in chemicals. The Karl Fischer reagent, distilled water, sodium chloride, methanol etc. was used for this study. All the chemicals used were of analytical grade.

Experimental Methodology:

Firstly, electrical flow was given in the apparatus and takes the Karl Fischer reagent in a burette and mixture of 1:1 ratio distilled water and methanol (50 ml each) in the Karl Fischer container. Start titration till the end point was obtained. The buzzer was automatically switched on. The sound was occurred by the apparatus when the titration was completed. The buzzer of switch may be pressed to stop the buzzer.

Now, in our next step we take the Karl Fischer reagent in a burette and mixture of 1:1 ratio distilled water and NaCl solution (50 mi each) in which 50mg NaCl in the Karl Fischer container and operate same process as mentioned earlier i.e:

Step I: 50ml methanol+ 50ml distilled water
Step II: 50ml NaCl solution (Present 50mg NaCl) + 50ml distilled water

Results and Discussion

Now, we can calculate the percentage moisture content in the following formula:

% moisture content

=K.F (ml)x MDF x100
Weight of the sample

[MDF = Moisture Determining Factor of K.F, KF (ml)]
From the step I, required 5 ml Karl Fischer reagent in which 1 ml K.F reagent sucks 10ml distilled water.

From the step II, required 6 ml Karl Fischer reagent in which it fully sucks 60ml distilled water.

10ml of KF reagent was consumed when 50 mg NaCl was used.
50 mg of NaCl will be having 15.66 x 50 of moisture
100
Thus, each ml of reagent was capable of 100 removing 7.83 mg of moisture.
Then, MDF value of the reagent was 7.83

[As mg of H_20/ml of K.F

= mg of sample x 0.1566]
mg of reagent K.F

The percentage of moisture content in sodium chloride = K.F (ml)x MDF x100

Weight of the sample (mg)

= 6x 7.83x100

50

=93.96%

Conclusion

The present study showed that the estimation of moisture content percentage in sodium chloride is 93.96% using Karl Fischer titration apparatus.

References

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