

3-(p-chlorophenyl)-3-(2, 4-dihydroxyphenyl) phthalide- A new Adsorbent Indicator Using for Argiometric Titration

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Abstract:-

The increasing level of chloride in water creates bad taste in drinking water and corrosiveness of metals also increases with increases the concentration of ions but its concentration has no adverse effects on health but high concentration of chlorides also affects the growth of vegetation for turbid water contaminated with Chloride. The ions concentration of halides and thiocyanide varies from sample to sample in water. Chloride is major anion present in potable as well as industrial water (about 250 mg/L). The chromatographic technique is the excellent method for analysis of these ions but an alternate method is Argiometric titration (use of silver nitrate). Argiometric titration is used for identification of halides & thiocyanide ion using Fluorescein but the new substituted phthalides (3-(p-chlorophenyl)-3-(2,4-dihydroxyphenyl) phthalide) is also show better result as adsorbant indicator in argiometric titration the present studies shows good adsorbility for Cl⁻, Br⁻, I⁻ & CNS⁻ ions.

Key words: - Argiometric Titration, Dye 3-(p-chlorophenyl)-3-(2, 4-dihydroxyphenyl) phthalide

Introduction:-

Fajans¹⁸² in 1923 uses the dye as adsorption indicators with fine studies being fluorescein in argiometric titration for the estimation of halides like Cl⁻, Br⁻, I⁻ & CNS⁻ ions and soon after modified by Kolthoff³. In the present study has been extended to an unsymmetrical dye 3-(p-chlorophenyl)-3-(2, 4-dihydroxyphenyl) phthalide. These shows better result in comparisons to Fluorescein as well as methyl resorcinol-3-nitro P⁴.

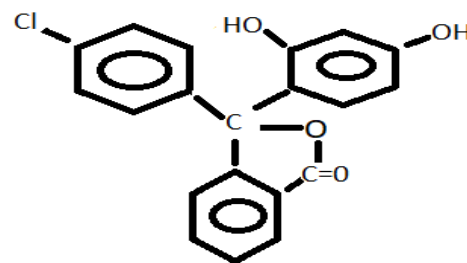
Experimental:-

Materials: AgNO₃, NaCl, KCNS and KI.

Indicator Solution: The dye 3-(p-chlorophenyl)-3-(2, 4-dihydroxyphenyl) phthalide was used as a indicator for titration and its 0.1% solution was prepared in rectified spirit, Eight drops of this indicator were used for every 10ml of the sample solution.

Preparation of the Dyes: Preparation of the necessary acid 2-(p-chlorobenzoyl) benzoic acid was carried out by a standard procedure⁵⁻⁹ and then acid was intimately mixed with resorcinol⁷ and the resulting mixture was heated at 140⁰ to 170⁰ to obtain a homogeneous solution. Then 2-3 drops of concentrated H₂SO₄ was added cautiously with stirring, and heating temperature was raised by 10⁰ and heating was continued for 3-4 hours to obtain a hard, brittle mass on cooling. The condensed mass so obtained was crushed and washed with water to removed the excess phenol. The product was extracted with 3% NaOH solution and than phthalides was precipitated from filtrate by adding of dil. HCl with stirring. The prepared dye was purified by repeated crystallisation from ethanol, dried in an oven at 100⁰ and then vacuum desiccators.

Structure of 3-(p-chlorophenyl)-3-(2, 4-dihydroxyphenyl) phthalide



(λ_{\max} – 460nm, λ_{\max} – 500nm with a few drops of alkali)

M.F. = C₂₀H₁₃O₄Cl,

pH = 9.0

Mol.Wt. = Observed-352.5, Calculated-364

Elemental analysis: Observed- C-68.09; H-3.69; Cl-10.07 %N-4.79,

Irv KBr: (3400, 1745, 1610, 1518, 1490, 1450, 875, 840, 800, 760, 690 Cm²)

NMR: 6.9-8.1(m, 11H, ArH), 6.25, 6.35 (each s. 1H each ArOH)

The following points come out on comparing the above dye with fluorescein.

