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BROMATOMETRY

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BROMATOMETRY is the process which involves the titration by oxidation using Potassium Bromate.

➤ Potassium bromate is a powerful oxidising agent which is reduced smoothly to bromide: $\text{BrO}_3 + 6\text{H}^+ + 6\text{e}^- \rightarrow \text{Br}^- + 3\text{H}_2\text{O}$

➤ The relative molecular mass is 167.00, and a 0.02M solution contains 3.34g L⁻¹ potassium bromate. At the end of the titration free bromine appears: $\text{BrO}_3 + 5\text{Br}^- + 6\text{H}^+ \rightarrow 3\text{Br}_2 + 3\text{H}_2\text{O}$



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PREPARATION OF 0.02M POTASSIUM BROMATE

- **Dry some finely powdered potassium bromate for 1-2 hours at 120°C, and allow to cool in a closed vessel in a desiccator.**
- **Weigh out accurately 3.34g of the pure potassium bromate, and dissolve in 1L of water in a graduated flask.**

DETERMINATION OF PHENOL

A number of phenols can be substituted rapidly and quantitatively with bromine produced from bromate and bromide in acid solution.



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The determination involves treating phenol with an excess of potassium bromate and potassium bromide.

- when bromination of the phenol is complete the unreacted bromine is then determined by adding excess potassium iodide and back-titrating the liberated iodine with standard sodium thiosulphate.**
- Procedure. Prepare an approx. 0.02M standard solution of potassium bromate by weighing accurately about 1.65g of the analytical grade reagent, dissolving it in water and making it up to 500 mL in a graduated flask.**



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- **To determine the purity of a sample of phenol, weigh out accurately approximately 0.3g of phenol, dissolve it in water and make the volume to 250 mL in a graduated flask.**
- **Pipette 25 mL volumes of this solution into 250 mL stoppered (ground-glass) conical flasks.**
- **To each flask pipette 25 mL of the standard potassium bromate solution and add 0.5g of potassium bromide and 5mL of 3M sulphuric acid.**



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- Mix the reagents and let them stand for 15 minutes, then rapidly add about 2.5g of potassium iodide to each flask, immediately re-stoppering and swirling the contents to dissolve the solid.**
- Titrate the liberated iodine with the standard 0.1M sodium thiosulphate until the solution is only slightly yellow, then add 5 mL of starch indicator solution and continue the titration until the blue colour disappears. Calculate the amount of excess bromate from the amount of thiosulphate needed for the back-titration of the free iodine, and hence the quantity of bromate which reacted with the phenol.**



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THANK YOU