

Subject Name- chemistry
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Experiment No. 8

Estimation of dissolved oxygen
in the given samples of water
by Winkler's method

* Aim - Estimation of dissolved oxygen in the given samples of water by Winkler's method.

* Objective - To find the amount of dissolved oxygen in the given samples of water by Winkler's method.

* Apparatus - BOD bottle, Burette, pipette, conical flask, stand etc.

* Chemicals - water sample, $\text{Na}_2\text{S}_2\text{O}_3$ solution, KI, dil H_2SO_4 , 0.025N $\text{K}_2\text{Cr}_2\text{O}_7$ solution, alkali-iodide-azide reagent, MnSO_4 solution, distilled water, starch indicator etc.

* Questions -

Q 1.) what do you understand by the phrase "fixation of dissolved oxygen"?

Ans → The quantity of dissolved oxygen is seemingly fixed by the addition of a series of reagents that form an acidic compound, which when titrated with a neutralizing compound results in a change in colour. The addition of alkali iodide acidic solution results in the formation of a brown precipitate of basic magnize oxide) indicating the presence of a fixed amount of dissolved oxygen (which otherwise would yield a white precipitate of $Mn(OH)_2$)

Q 2.) what is the effect of oxidizing impurities like NO_2^- and Fe^{3+} (if not removed) on the DO results?

Ans → These oxidizing ions (NO_2^- & Fe^{3+}) might convert the water molecules into oxygen gas by interacting with them in the form of oxidizing impurities to generate more dissolved oxygen which would interfere with the existing oxygen present in the dissolved form, altering its quantity variably and disturbing the existing fixation.

Q 3) what is the effect of reducing impurities like SO_4^{2-} , S^{2-} and Fe^{3+} (if not removed) affect the DO determination?

Ans → Reducing impurities, much like oxidising ones mentioned before would interfere with the existing quantity of dissolved oxygen by reducing the dissolved O_2 into OH^- ions, affecting the existing DO fixation.

Q 4) what is the optimum DO value for drinking water as per standard WHO norms?

Ans → Permissible drinking water range as per WHO guidelines is capped at 7.5 mg/L.

Q 5) what is the significance of DO measurement?

Ans → Atmospheric oxygen doesn't dissolve very readily in water and varies proportionately with partial pressure & this is impacted by different factors like temperature, altitude, organic concentrations etc making it very important to measure the DO accurately for different kinds of water available as it indicates:

