

DISSOLVED OXYGEN

What is Dissolved Oxygen?

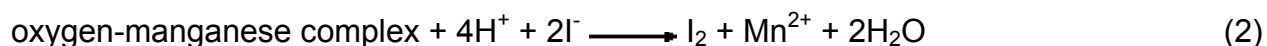
Dissolved oxygen is the term used for the amount of gaseous oxygen, which is dissolved or trapped in liquid medium. The solubility of oxygen changes for different liquid substances and different temperatures. When a liquid solution holds all the dissolved oxygen it can hold at a given temperature, it is said to be 100% saturated. If the liquid substance holds half-as-much oxygen as it can hold at a given temperature, it is 50% saturated. The units can also be reported in ppm if solubility information is available.

Dissolved oxygen is a measurement of water quality in:

- Waste water
- Drinking water
- Natural bodies of water

Winkler Titration

The relevant chemical reactions occurring throughout the procedure are outlined below:



Addition of the manganous sulfate and the alkaline-iodide results in the formation of an insoluble oxygen-manganese complex (1), the precipitate in step 2. The oxygen is stable in this form for several days. Both the manganous sulfate and the alkaline-iodide are added in excess to ensure reaction with all of the oxygen. Treatment with the sulfuric acid dissolves the complex and liberates free iodine (2), imparting the distinctive yellow-gold color. The amount of free iodine is proportional to the amount of oxygen dissolved in the original sample. By titrating a measured portion of the sample against a standardized sodium thiosulfate solution (3), the amount of free iodine—and the corresponding amount of oxygen—is determined. The starch "indicator" (which forms a distinctly colored complex with the free iodine) is used to provide an unmistakable visual endpoint for the titration.

The concentration of dissolved oxygen (DO) is one of the most important indicators of the overall health of a body of water. Waters with consistently high levels of DO (> 6 mg/L) typically support the most diverse biological communities. Waters with consistently low DO levels (< 3 mg/L) may be virtually devoid of aquatic life or may harbor only a few species adapted to such conditions.