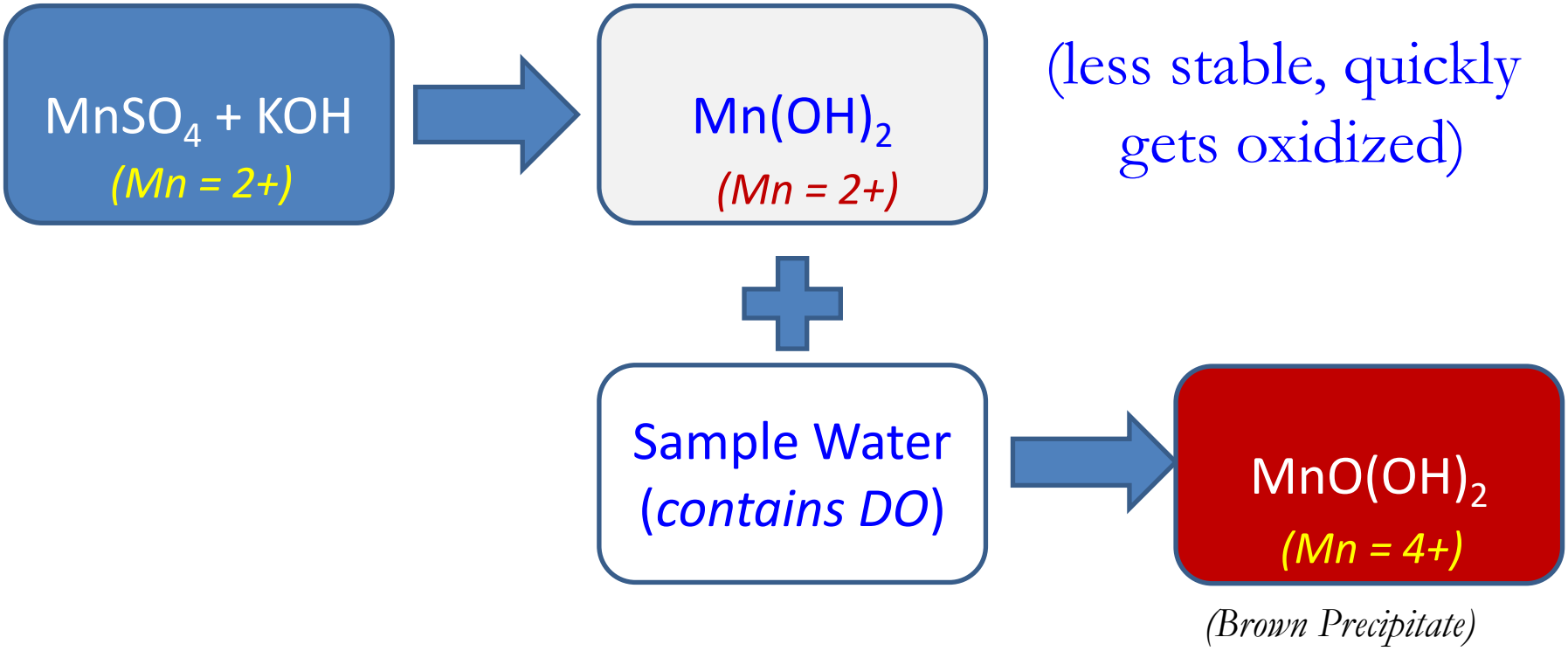
Dissolved Oxygen Determination

- Sample water with DO + Chemical Compound which takes oxygen from water and oxidizes

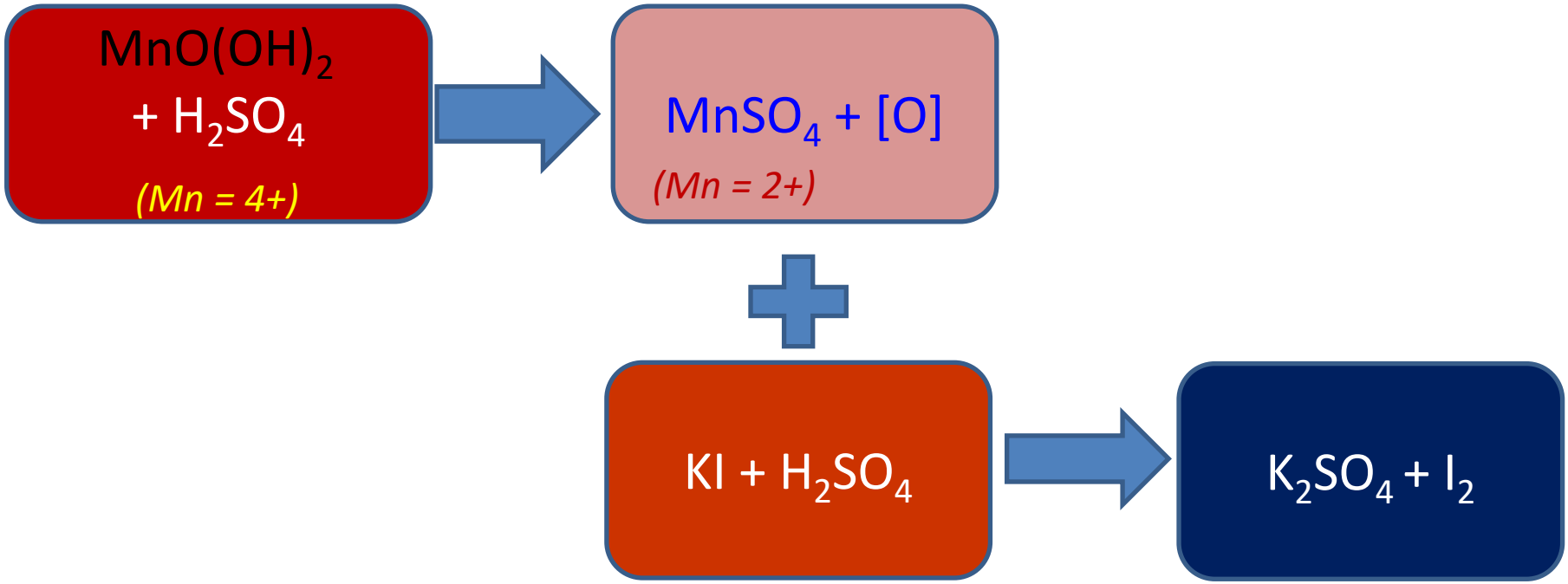
Concentration of oxidized chemical compound α DO

DO Determination - **Winkler's method**



i) Oxygen present in sample water oxidizes Mn^{2+} to Mn^{4+}

DO Determination - **Winkler's method**



i) Mn^{4+} in sulphate form reacts with KI and liberates I_2 (Iodometric titration)

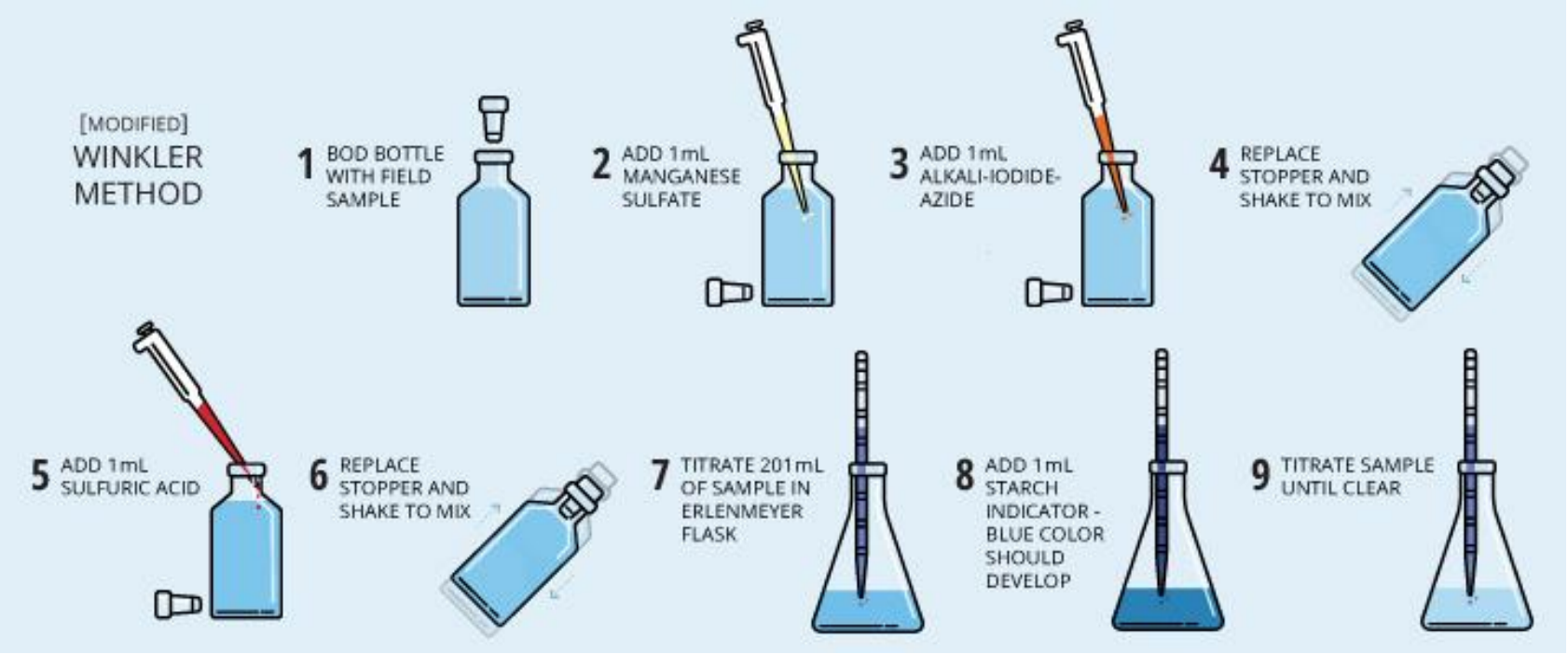
ii) [DO] α [Mn^{4+}] α [I_2]

(Sodium thiosulphate can be used to estimate the concentration of I_2 with Starch Indicator)

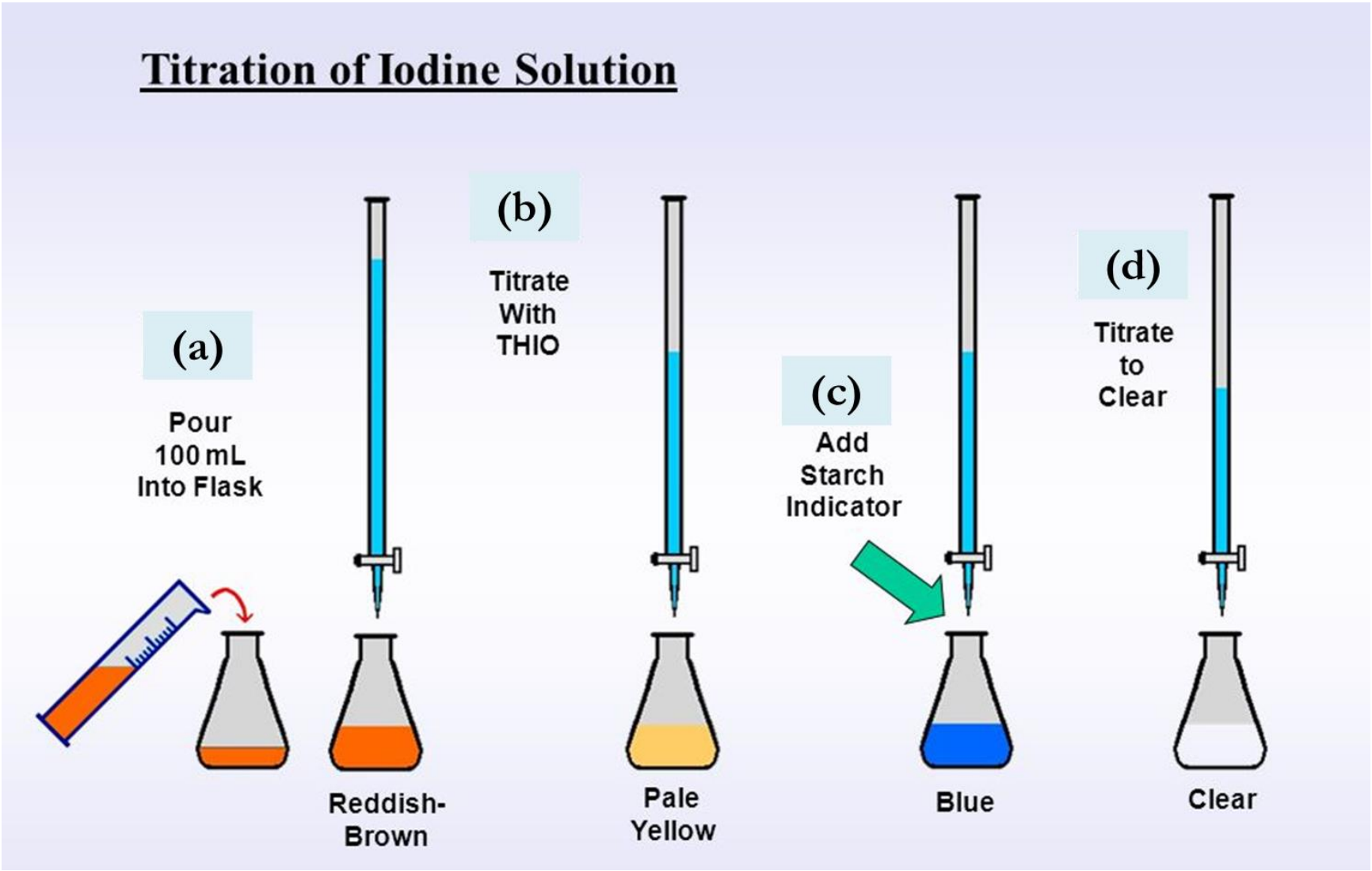
Estimation of DO by Winkler's method

Theory of Winkler's Method:

- Oxygen in the water sample oxidizes iodide ion (I^-) to iodine (I_2) quantitatively.
- The amount of iodine generated is then determined by titration with a standard thiosulfate ($S_2O_3^{-2}$) solution.
- The endpoint is determined by using starch as a visual indicator.



Estimation of DO by Winkler's method



Estimation of DO by Winkler's method

$$MnSO_4 + 2KOH \longrightarrow Mn(OH)_2 + K_2SO_4$$

$$2Mn(OH)_2 + O_2 \longrightarrow 2MnO(OH)_2$$

$$MnO(OH)_2 + H_2SO_4 \longrightarrow MnSO_4 + 2H_2O + [O]$$

$$2KI + H_2SO_4 + [O] \longrightarrow K_2SO_4 + H_2O + I_2$$

$$I_2 + 2Na_2S_2O_3 \longrightarrow Na_2S_4O_6 + 2NaI$$

- The amount of oxygen can then be computed from the titre values