Week 1 Term 2 question: (NZIC 2013)

VO3–(aq) is yellow; VO2+(aq) is blue; V3+(aq) is green; V2+(aq) is violet

In acid conditions, 22.1 mL of 0.0500 mol L–1 potassium permanganate solution is required to convert 20.0 mL of violet V2+(aq) to a yellow solution containing vanadium only as VO3–(aq).

Write ion-electron half-equations and a balanced net ionic equation for the reaction taking place.

What volume of 0.0500 mol L–1 sulfite solution would now be required to convert the yellow solution entirely to blue VO2+(aq)?