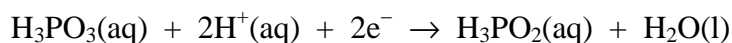


**Marks**  
**3**

- The standard reduction potential of phosphorous acid to hypophosphorous acid is  $-0.499\text{ V}$ , with the following half-reaction:

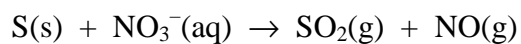


What would the reduction potential be for this half reaction at a temperature of  $25\text{ }^\circ\text{C}$  in an aqueous solution with pH of 2.3 and concentrations of  $[\text{H}_3\text{PO}_3(\text{aq})] = 0.37\text{ M}$  and  $[\text{H}_3\text{PO}_2(\text{aq})] = 0.00025\text{ M}$ ?

Answer:

**2**

- A number of bacteria can reduce the nitrate ion in the presence of sulfur. A simplified unbalanced redox reaction can be written as:



Balance this redox equation for acidic conditions.