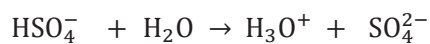
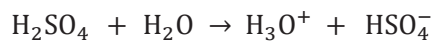
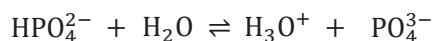
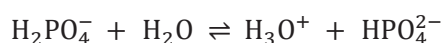
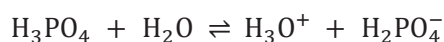


Polyprotic acids ionise in more than one step when reacted with water. For example, the equations below describe the two-step ionisation of sulfuric acid, a diprotic acid. One proton is transferred in each step of the ionisation process.



The equations below describe the three-step ionisation of phosphoric acid, a triprotic acid.



### Question 131

Acids are classified as monoprotic or polyprotic.

- (a) Classify the following acids as monoprotic, diprotic or triprotic.

Compound	Classification
chromic acid, $\text{H}_2\text{CrO}_4$	
perchloric acid, $\text{HClO}_4$	
arsenic acid, $\text{H}_3\text{AsO}_4$	
hydrosulfuric acid, $\text{H}_2\text{S}$	
benzoic acid, $\text{C}_6\text{H}_5\text{COOH}$	
malonic acid, $\text{CH}_2(\text{COOH})_2$	

(6 marks) KA1

- (b) Write an equation to show the ionisation of iodic acid,  $\text{HIO}_3$ .

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(1 mark) KA4

- (c) Write equations to show the complete ionisation of oxalic acid,  $\text{H}_2\text{C}_2\text{O}_4$ .

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(2 marks) KA4

- (d) Write equations to show the complete ionisation of boric acid,  $\text{H}_3\text{BO}_3$ .

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(3 marks) KA4