

## Evidence for hydrogen bonds

### Boiling points of various compounds

#### Your task

The three tables below show the boiling points,  $T_b$ , for various compounds that contain hydrogen.

1. On **one** graph, plot  $T_b$  (vertical axis) against period number (horizontal axis) for each of the compounds listed:
  - label the three lines to distinguish between the compounds with the general formulae HX,  $H_2X$  or  $XH_3$ ;
  - indicate the formulae of the compounds against their points on the graph.
2. Describe your graphs and give reasons for their shapes.

Period number	Formula	$T_b(^{\circ}\text{C})$
2	HF	20
3	HCl	-85
4	HBr	-67
5	HI	-35

Table 1    Compounds with the general formula HX

Period number	Formula	$T_b(^{\circ}\text{C})$
2	$H_2O$	100
3	$H_2S$	-61
4	$H_2Se$	-42
5	$H_2Te$	0

Table 2    Compounds with the general formula  $H_2X$

Period number	Formula	$T_b(^{\circ}\text{C})$
2	$NH_3$	-33
3	$PH_3$	-88
4	$AsH_3$	-55
5	$SbH_3$	-17

Table 3    Compounds with the general formula  $XH_3$