Spot the bonding

The diagrams below show a few different chemical substances and a range of models. For each diagram either write:

* the name(s) of the type(s) of bonding present
* ‘none’ (if there is no chemical bonding)
* ‘don’t know’ (if you are unsure)

|  |  |  |
| --- | --- | --- |
| An alternating array of small and large circles. The small circles are pale orange and are labelled 'Na+'. The large circles are dark orange and are labelled 'Cl-'. Each small pale orange circles is touching four of its neighbouring large orange circles and vice versa. | A rectangle containing an array of overlapping circles in five rows and 7 columns. The overlapping pattern continues beyond the rectangle. In the centre of each circles is the letter C. Each circles overlaps with four of its neighbours - one above, one below, one to the left and one to the right. Within each overlapping segment there are two black dots. This means that each circles is surrounded by eight black dots. | A regular arrangement of dark orange circles. Each circle has the symbol Cu^2+ in the centre. The dark orange circles are not touching but are surrounded by a pale orange background. |
| **1.** Sodium chloride lattice | **2.** Diamond lattice | **3.** Copper metal lattice |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Two concentric circles with +9 in the centre. The larger (outermost) of the two concentric circles overlaps with a neighbouring smaller circle (the same size as the inner most circle of the two concentric ones). This neighbouring circle has +1 in the centre. The outermost of the concentric circles has 8 dots spaced around in pairs. Two of these dots are at the intersections with the neighbouring circle. The inner concentric circle has two dots on it. | Five pairs of white circles outlined in black, each with the letter O in the centre. None of the circles are touching. However, each pair of circles is surrounded by a pale orange circle which slightly overlaps but has no outline. | A large red dot surrounded by three concentric circles. On the innermost concentric circle there are two black dots, one to the left and one to the right. On the middle concentric circle there are eight black dots - two to the left, two to the right, two at the top and two at the bottom. On the outermost concentric circle there is one black dot to the right. |
| **4.** Hydrogen fluoride molecule | **5.** Oxygen gas | **6.** Sodium atom |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| A chemical symbol made up of the letter O followed by two lines, then the letter C, another two lines, then another O. (O=C=O) | A white circle, outlined in black with the letter N at the centre. Spaced at an equidistant  120 degrees around the circle labelled N are three smaller circles labelled H. These three circles are also white with a black outline. None of the circles are touching. All of the white circles are surrounded by a pale orange circle with no outline. These pale orange circles slightly overlap. | An alternating array of small and large circles. The small circles are are dark orange and are labelled 'Mg^2+'. The large circles are dark white and are surrounded by a pale orange circle. The white circles are labelled 'O^2-'. Each small dark orange circle is touching four of its neighbouring pale orange circles and vice versa. |
| **7.** Carbon dioxide molecule | **8.** Ammonia molecule | **9.** Magnesium oxide lattice |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |