ANSWERS: **Shapes of molecules**

**You don’t have to draw 3D shapes in Level 2 Chemistry.**

**When sketching shapes of molecules non-bonding/lone pairs/valence electrons don’t have to be shown.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **BCl3**    **trigonal planar**  **120 °** | | | | | **COBr2**    **trigonal planar**  **120 °** | | | |  | | | | |
| **F2CO**    **trigonal planar**  **120 °** | | | | | **AsF3**    **trigonal pyramid**  **109 °** | | | | **C2H5OH**  **C atoms have a tetrahedral parent geometry, overall shape tetrahedral**  **O atom has a tetrahedral parent geometry, overall shape bent** | | | | |
| **CCl3F**    tetrahedral  **180 °** | | | | | **N2O**    **linear**  **180 °** | | | | **NOCl**    **linear**  **180 °** | | | | |
| HOCl    bent/v-shaped  less than 109.5° | | | | | **NH3**  **A picture containing object, clock  Description automatically generated**  trigonal pyramid  less than 109.5 ° | | | | **N2H4**    **trigonal pyramid**  **less than 109 °** around N atom | | | | |
| CH4    tetrahedral  **109.5**° | | | | | **AsH3**    trigonal pyramid  less than 109.5 ° | | | | **NF3**    **trigonal pyramidal**  **less than 109.5** ° | | | | |
| **BF3**    **trigonal planar**  **120**° | | | | | **PF3**    trigonal pyramidal  less than 109.5° | | | | **CCl4**    **tetrahedral**  **109.5**° | | | | |
| **PH3**    trigonal pyramidal  less than 109.5° | | | | | **CO2**      linear  180 **°** | | | | **H2CO (or CH2O)**  Image result for H2CO shape  trigonal planar  120 **°** | | | | |
| **H2O**    **less than 109.5** **°**  **bent or v-shaped** | | | **CH2Br2 or CH2Cl2**    **tetrahedral**  109.5° | | | | | | **CS2**    linear  180**°** | | | | |
| **O2**    **linear**  180 **°** | | **CH3Br or CH3Cl**    **tetrahedral**  109.5° | | | | | **SO2**    bent/v-shaped  less than 109.5° | | | | bent/v-shaped  less than 109.5° | | |
| **XO2**  **(where X has 4 valence electrons)**    **linear**  180 **°** | | | | **YO2**  **(Y has 6 valence electrons)**    bent/v-shaped  less than 120 **°** | | | | | **NCl3**    **trigonal pyramidal**  **less than 109.5** **°** | |
| **PBr3 or PCl3**    **trigonal pyramidal**  **less than 109.5** **°** | | | | **H2S**    **less than 109.5** **°**  v-shaped or bent | | | | | **COCl2**    trigonal planar  120**°** | |
| **OCl2 aka Cl2O**    v-shaped/bent  less than 109.5 **°** | | | | **SiCl4**    **tetrahedral** | | | | | **HCN**    **linear**  **180°** | |
| **SF2**    **bent/v-shaped**  **less than 109.5** **°** | | | | | **F2O or OF2**    **bent/v-shaped**  **less than 109.5** **°** | | | | **N2**    linear  180**°** | |

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