|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TASK # | | ANSWER | | | | | | | |
| **1** | Sort by: Ionic, covalent or metallic | Ionic | | | Covalent | | Metallic | | |
|  | | |  | |  | | |
| **2** | Sort by: Polar or non-polar | Polar | | | | Non-Polar | | | |
|  | | | |  | | | |
| **3** | Sort by: “Dominant” IMF present –  Dipole-dipole or London Forces | Dipole-Dipole | | | | London Forces | | | |
|  | | | |  | | | |
| **4** | Sort by: Hydrogen bonding or  No Hydrogen bonding | Hydrogen Bonding | | | | No Hydrogen Bonding | | | |
|  | | | |  | | | |
| **5** | Sort by: Dipole-dipole or hydrogen bonding | Dipole-Dipole | | | | Hydrogen Bonding | | | |
|  | | | |  | | | |
| **6** | Sort by: “Dominant” IMF present –  London, Dipole-dipole, or Hydrogen Bonding | London Forces | | Dipole-Dipole | | | | Hydrogen Bonding | |
|  | |  | | | |  | |
| **7** | Rank from: Lowest to Highest expected boiling point | Lowest |  | | | | | | Highest |
| **8** | Rank from: Lowest to Highest expected boiling point | Lowest |  | | | | | | Highest |

**Name: Period: Seat#:**

**Worksheet #15**

A qr code with a few squares

Description automatically generated

**Absent? Didn’t finish?** Use this digital version to finish the activity! <https://tinyurl.com/yfhzn2wz>

|  |  |
| --- | --- |
| Q# | Questions |
| **1** | HBr, O2 and CH3OH all have comparable molecular masses. List the dominant type of IMF, then rank the strength of each compound based on IMFs within the samples. (1 = strongest, 2 = in between, 3 = weakest).  Substance IMF Relative Strength  HBr  O2  CH3OH |
| **2** | Circle the substances below that can form a hydrogen bond in its pure form. Explain why the other species couldn't hydrogen bond. C2H6 CH3NH2 KCl CH3CH2CH2OH CH3OCH3 |
| **3** | Rank the following compounds from weakest intermolecular forces to strongest. Justify your answers.  H2S I2 N2 H2O |
| **4** | Rank the following from weakest intermolecular forces to strongest. Justify your answers.  *They are all bent like water)* H2Se H2S H2Po H2Te |
| **5** | Using your knowledge of molecular structure, identify the main intermolecular force in the following compounds. You may find it useful to draw Lewis structures to find your answer. PF3 H2CO HF |
| **6** | Explain how dipole-dipole forces cause molecules to be attracted to one another. |
| **7** | Explain how London Forces cause molecules to be attracted to one another. |
| **8** | Rank the following compounds from lowest to highest boiling point:  calcium carbonate, methane, methanol (CH4O), dimethyl ether (CH3OCH3). |
| **9** | Explain why nonpolar molecules usually have much lower surface tension than polar ones. |
| **10** | What is the difference between a regular dipole-dipole force and a hydrogen bond force? What is an example of hydrogen bonding that occurs in your body? |

**Fill out the missing information in the chart below:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q#** | **Name** | | **Formula** | | | **Type of IMF** | | |
| **1** | Aluminum sulfate | |  | | |  | | |
| **2** | Ammonium phosphate | |  | | |  | | |
| **3** |  | | CO2 | | |  | | |
| **4** |  | | CaCO3 | | |  | | |
| **5** | Nitrogen trihydride | |  | | |  | | |
| **6** |  | | S2F2 | | |  | | |
| **7** |  | | P2O5 | | |  | | |
| **8** | Magnesium nitrate | |  | | |  | | |
| **9** |  | | Pb3P2 | | |  | | |
| **Q#** | **Formula** | **Lewis Structure** | | **Polar or non-polar?** | **Q#** | **Formula** | **Lewis Structure** | **Polar or non-polar?** |
| **10** | CH2F2 |  | |  | **13** | CH2O |  |  |
| **11** | CO2 |  | |  | **14** | SeH2 |  |  |
| **12** | NCl3 |  | |  | **15** | NO3- |  |  |

**Order each group below from strongest to weakest IMF and give the type of IMF:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **16** | N2, HF, Na, CH2O | | | | | | |
| *Formula* | *Strongest* |  |  |  |  | *Weakest* |
| *IMF* |  |  |  |  |
| **17** | H2S, NH3, CH4, (NH4)2SO4 | | | | | | |
| *Formula* | *Strongest* |  |  |  |  | *Weakest* |
| *IMF* |  |  |  |  |