

Matter HW 1 KEY

matter	Anything that takes up space (has volume) and has mass (moves the scale).
element	Any one of 118 naturally occurring pure substances made up of one kind of atom.
compound	Any of billions of pure substances made up of 2 or more kinds of atoms.
substance	Elements or compounds, one kind of “stuff”/
mixture	Any mish-mash of 2 or more pure substances (elements, compounds, or elements and compounds). These do not have one formula and the proportions can vary.
homogeneous	A mixture that is the same throughout (think: salty water or the air)
heterogeneous	A mixture that is not the same throughout (think: vegetable soup, or chocolate milk with too much chocolate sauce to dissolve).
What are elements “Hg” and “W” and why aren’t they M & T instead?	Many elements are named in languages that are not English. Latin, French, German, etc. Hg is hydrargyrum (Latin), and W is wolfram (German). My money is in the M& T Bank, who’s old name was Manufacturers & Traders Bank.
List substances you have experienced in at least 2 phases	Jello as liquid and as a solid. Dry ice as a solid and a gas, Ice cream, although liquid ice cream is sort of a mistake, eat faster. Pancake batter, etc.
List substances you have experienced in ALL 3 PHASES	H ₂ O as ice and liquid water, and as steam.

Use Table S to determine phases of elements at any temperature. If your temp is BELOW the melting point, you are frozen SOLID. If your temp is between melting and boiling, then you are in the LIQUID phase. If your temp is ABOVE the boiling point, you are in the GAS phase. Put the “S”, “L”, and “G” on your table now. Boron at 4033 Kelvin is in the LIQUID phase.

Table S
Properties of Selected Elements

Atomic Number	Symbol	Name	First Ionization Energy (kJ/mol)	Electro-negativity	S	Melting Point (K)	L	Boiling* Point (K)	G
1	H	hydrogen	1312	2.2	↓	14	↓	20.	↓
2	He	helium	2372	—		—		4	
3	Li	lithium	520.	1.0		454		1615	
4	Be	beryllium	900.	1.6		1560.		2744	
5	B	boron	801	2.0	↓	2348	↓	4273	↓

Fill in all the open boxes. Use table S to help you through this.

name	symbol	Is this an element, compound, or mixture?	Phase at 298 K, room temp solid, liquid, gas, or aqueous
Gold	Au	Element	solid
Carbon dioxide	CO ₂ (G)	Compound	gas
Gallium	Ga	Element	solid
Carbon	C	Element	solid
Iron	Fe	Element	solid
Salty water	NaCl _(AQ)	Compound	aqueous
Table Sugar	C ₁₂ H ₂₂ O ₁₁ (S)	Compound	solid
Iodine	I ₂ (S)	Element	solid
Bromine	Br ₂ (L)	Element	liquid
Mercury	Hg	Element	liquid
Helium	He	Element	gas

Matter HW #2 <u>both sides</u> name			
Memorize this chart; you will not be able to move ahead in chem unless you understand all the vocabulary and remember how these properties exist. The important Properties of the States of Matter			
Property	SOLIDS	LIQUIDS	GASES
volume	Definite	Definite	Indefinite
shape	Definite	Indefinite	Indefinite
compressibility	Almost zero	Almost zero	Easily
heat expansion	Slight	Slight	Greatly

What phase are these substances at 22°C. (convert to Kelvin)	
formula	solid, liquid or gas?
Co	solid
H ₂ O	liquid
Mg	solid
Cl ₂	gas
Br ₂	liquid
CO ₂	gas
I ₂	solid
Xe	gas
Hg	liquid
Ti	solid

Write the symbols of the substances at left that answer these questions.	
Which <u>element</u> has the highest BP	Ti 3560 Kelvin
Which <u>compound</u> has the highest BP	H₂O 100°C
Which are easily compressed?	Gases: Cl₂, CO₂, Xe
Which has definite volume and indefinite shape?	Liquids: H₂O, Br₂, Hg
Which always fills any container you put them into?	Gases: Cl₂, CO₂, Xe
Which fills only the bottom of any container?	Liquids: H₂O, Br₂, Hg
Which always retains its shape no matter what container it's in?	Solids: Co, Mg, I₂, Ti
Which has indefinite shape and indefinite volume?	Gases: Cl₂, CO₂, Xe
Which of these is a noble gas?	Xe

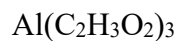
How many atoms are in one unit of each of these formulas?



7



5



22



20



5



32



2



2



5



8



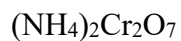
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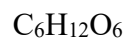
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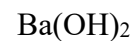
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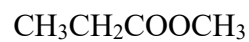
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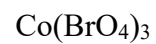
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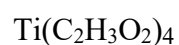
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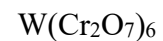
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