21 a Na_2S sodium sulfide

b. Al_2O_3 aluminum oxide

c. GaF_3 gallium fluoride

d. RbI rubidium iodide

e. BaSe barium selenide

22. a $Ca(HCO_3)_2$

b. $CaCO_3$

c. $MgCl_2$

d. $MgSO_4$

21-24 +4

23 a Potassium acetate

b Calcium hypochlorite

c. Lithium hydroxide

d. Sodium sulfate

24 a cobalt oxide

b. manganese chloride

c. zinc sulfide

d. Tin bromide

Nienow

[redacted]

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Ch 5 Key

Out of 623

3. 2.59% of water supply +½

$500L \times 0.0259 = 12.95\ L$

9. a. They are the same

$\frac{12\ mol\ HCl}{L} \times 0.1\ L = 1.2\ mol\ HCl$

+1

$\frac{12\ mol\ H_2SO_4}{L} \times 0.1L = 1.2\ mol\ H_2SO_4$

b. They are different because of different molecular weights.

$1.2\ mol\ HCl \times \frac{36.458g}{1\ mol} = 43.75g\ HCl$

$1.2\ mol\ H_2SO_4 \times \frac{98.08g}{1\ mol} = 117.703g\ H_2SO_4$

13. N 3.0 S 2.5 H 2.1

C 2.5 O 3.5 F 4.0

a. NC = 0.5 NH = 0.9

SO = 1.0 SF = 1.5

+2

b. Circled atom is the one that attracts e⁻ more

(N)C (N)H

S(O) S(F)

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c. NC, NH, SO, SF

25. a. The light bulb will light up because $CaCl_2$ is ionic.

b. C_2H_5OH is not ionic so the light bulb won't light up. +1

c. H_2SO_4 is ionic, so the light bulb lights up.

29. a. $\frac{1.5 \text{ mol}}{1 \text{ L}} \times 2 \text{ L} = 3 \text{ mol}$

$KOH \rightarrow 39.1 + 16 + 1.008 = 56.108 \frac{g}{mol}$

$3 \text{ mol} \times \frac{56.108 \text{ g}}{1 \text{ mol}} = 168.324 \text{ g}$

Weigh out 168.324 g KOH + place in 2L Volumetric flask. Add water to mark.

b. $\frac{0.05 \text{ mol}}{1 \text{ L}} \times 1.0 \text{ L} = 0.05 \text{ mol}$

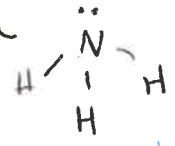
$0.05 \text{ mol } NaBr \times \frac{102.89 \text{ g}}{1 \text{ mol}} = 5.1445 \text{ g}$

Weigh out ~5.15 g NaBr + place in 1L volumetric flask. Add water to mark.

c. $\frac{1.2 \text{ mol } Mg(OH)_2}{1 \text{ L}} \times 0.1 \text{ L} = 0.12 \text{ mol}$

$0.12 \text{ mol} \times \frac{58.326 \text{ g}}{1 \text{ mol}} \approx 7 \text{ g}$ / 100 mL

Weigh out 7 g $Mg(OH)_2$ into volumetric flask. Add water to mark.

15a 

b. yes the electronegativity difference is 0.9. +1

c. yes

d. yes because it can form H bonds. Like dissolves like.

16. Hydrogen bond. Intermolecular bond. +1/2

19. Water expands when it freezes and so pipes can burst. +1

20.

a. Cl^- atom: $:\dot{C}l\cdot$ ion: $:\dot{C}l:$ ← add one electron

b. Ba^{2+} atom: $\cdot Ba\cdot$ ion: Ba ← lost two electrons

c. S^{2-} atom: $:\dot{S}\cdot$ ion: $:\dot{S}:$ ← gain two electrons

d. Li^+ atom $Li\cdot$ ion Li ← lost one electron

e. Ne atom: $:\dot{N}e:$ ion same

All of them gain or lose e^- to satisfy octet rule.

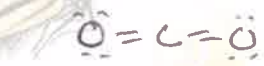
29d. $3.0\ \frac{mol}{L} \times .3\ L = 0.9\ mol$

$0.9\ mol\ CaCl_2 \times \frac{110.9}{1\ mol} = 99.81$

Add 99.81 g $CaCl_2$ to 300 mL Volumetric flask and add water to the mark.

36. Carbon dioxide is a good example of a triatomic molecule that has polar bonds but is not a polar molecule. This is because the molecule is linear.

+1



38. Ammonia can have Hydrogen bonds and is a polar molecule. More energy is needed to boil the ammonia + break the intermolecular bonds.

+1/2

45. Follow graph over from Absorbance = 0.4 to red

+1/2

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Calibration curve + find $[Pb^{2+}]$ on x-axis. Ans: ~27 ppb