

TODAY

- CHECK PEERS HOMEWK
- LECTURE

TURN IN //  
"UNIT 9"  
LAB Before  
CLASS

## PURPOSE: How To COUNT PARTICLES OF "ANIONS" IN AN AQUEOUS SOLUTION

WARMUP "In one dissolved  $\text{AlCl}_3$  how many cations?" one  
 $\text{Al}^{3+}$  is the cation.

#1 Show a balanced equation for  $(\text{NH}_4)_3\text{N}$  Dissolving:



\*Remember ions have charges!

#2 If we had 99  $(\text{NH}_4)_3\text{N}$ , how MANY CATIONS COULD BE MADE IF DISSOLVED IN WATER?

$$99 \text{ units of } (\text{NH}_4)_3\text{N} \times \left( \frac{3 \text{ NH}_4 \text{ CATIONS}}{1 \text{ UNITS } (\text{NH}_4)_3\text{N}} \right) = 297 \text{ NH}_4^+ \text{ CATIONS}$$

**How do Odd Formula Ions Dissolve?**  
 Chemistry: <http://gender.weebly.com>  
 Stop in for help every day at lunch and Tues, & Thurs after school  
 After-hours question? Email me at home: [edgenest@modison.k12.wv.us](mailto:edgenest@modison.k12.wv.us)



ANSWERS

Name \_\_\_\_\_  
 Period \_\_\_\_\_

1. Circle the metallic element in each.

Circle any element that is a metal	This substance is...	When one of these dissolves, how many aqueous ions form?
<u>Cu</u> NO <sub>3</sub> (aq)	ionic / molecular	two
N <sub>2</sub> O <sub>4</sub> (g)	ionic / molecular	

Circle any element that is a metal	This substance is...	When one of these dissolves, how many aqueous ions form?
Na <sub>2</sub> C <sub>2</sub> O <sub>4</sub> (s)	ionic / molecular	
H <sub>3</sub> PO <sub>4</sub>	ionic / molecular	

Solved in lecture: If 333 formula units of Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> were dissolved, how many anions would form?

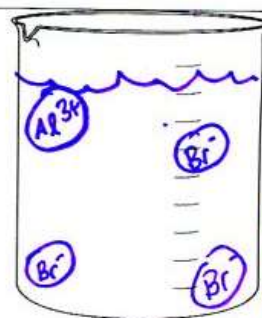
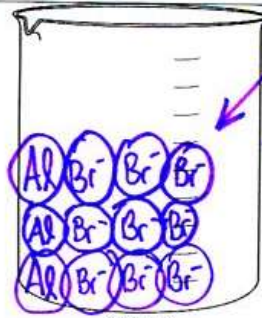
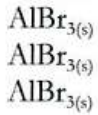
Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> → 2Na<sup>+</sup> + C<sub>2</sub>O<sub>4</sub><sup>2-</sup>

How many cations would form?

333 Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> ×  $\frac{1 \text{ C}_2\text{O}_4^{2-} \text{ units}}{1 \text{ Na}_2\text{C}_2\text{O}_4}$  = 333 C<sub>2</sub>O<sub>4</sub><sup>2-</sup> units

333 Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> ×  $\frac{2 \text{ Na}^+ \text{ units}}{1 \text{ Na}_2\text{C}_2\text{O}_4}$  = 666 Na<sup>+</sup> units

2. Draw three aluminum bromides in the left beaker:



3. Draw a slash through the molecule to show the half that would fall off. How many pieces will this fall apart into if made into an aqueous solution? (circle your choice)

KI	1? 2? 3? 4? 5?	AlBr <sub>3</sub>	1? 2? 3? 4? 5?
K <sub>2</sub> S	1? 2? 3? 4? 5?	(NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub>	1? 2? 3? 4? 5?
MgCO <sub>3</sub>	1? 2? 3? 4? 5?	Ca(CH <sub>3</sub> COO) <sub>2</sub>	1? 2? 3? 4? 5?
Zn(NO <sub>3</sub> ) <sub>2</sub>	1? 2? 3? 4? 5?	CH <sub>3</sub> OH	1? 2? 3? 4? 5?

4. True / False: Mark (T) true or (F) in each blank

- (a) \_\_\_\_\_ solutions are heterogeneous mixtures  
 (b) \_\_\_\_\_ solutions are clear  
 (c) \_\_\_\_\_ the dissolved substance will eventually settle out of a solution

5. For each, write a BALANCED dissociation equation (something like "A(s) -> B(aq) + C(aq)").  
 IMPORTANT! Include charges (+1, +2, etc) and phase notation (s, l, g, aq)

a. Powdered  $K_2S_{(s)}$  dissolving to form an aqueous solution.



b.  $CO_{2(g)}$  dissolving.



c. Powdered  $Zn(NO_3)_2$  that has been poured into water and stirred to form a solution

6. If 38 formula units of  $K_2S$  were dissolved, \_\_\_\_\_ ? (The formula and charge of the cation is \_\_\_\_\_)

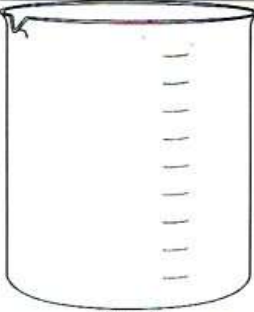

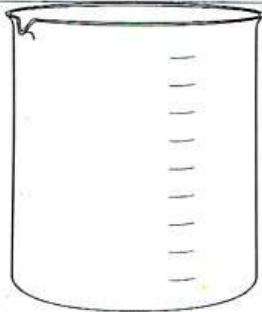
*Keep going.  
Draw in the numbers.*

7. If 38 formula units of  $Zn(NO_3)_2$  were dissolved, how many anions would form? (The formula and charge of the anion is  $NO_3^-$ )

$$38 \text{ Zn(NO}_3)_2 \text{ formula units} \times \left( \frac{2 \text{ NO}_3^- \text{ IONS}}{1 \text{ Zn(NO}_3)_2 \text{ formula units}} \right) = 76 \text{ NO}_3^- \text{ IONS}$$

8. Drawings!

- In the beaker on the left, draw the indicated solid, repeating the formula three times.
- In the beaker on the right, draw what the substance would look like with water added.

<p>9. Draw two ammonium carbonates in each beaker:  <math>(NH_4)_2CO_3</math>  <math>(NH_4)_2CO_3</math></p>			
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10. For each molecule below circle a choice to indicate it to form in solution.

- |                |            |             |             |
|----------------|------------|-------------|-------------|
| (a) $C_2H_5OH$ | 1 particle | 2 particles | 3 particles |
| (b) $SO_3$     | 1 particle | 2 particles | 3 particles |
| (c) $Li_3PO_4$ | 1 particle | 2 particles | 3 particles |
| (d) $FeF_3$    | 1 particle | 2 particles | 3 particles |

*Keep going.  
Draw more*