Mole Lab

Object: To understand the concept that chemists can count out infinitesimally small particles by weighing—applying the concepts:

- Chemical formula → Molar Mass (grams/mole)
- Avogadro's Number → molecules/mole (a constant)

You will need to write up this experiment in your lab book AND show all of the steps of every calculation in the lab book.

Materials:

- Al foil
- Ammonium sulfate
- Sodium chloride
- Dihydrogen monoxide, distilled

Equipment:

- Balance, Triple Beam
- Beakers
- Plastic cups in three colors
- Spoons
- Graduated cylinder

Safety Precautions:

- Wear safety goggles.
- Wash hands thoroughly with soap and water when finished.
- Do not touch face with hands until washed up.

Procedure:

- You will be given a worksheet with instruction for what you need to weigh out and bring to me for verification of you accuracy and precision in BOTH calculation and weighing..
- Before making any weighing measurement you must calculate the mass (in grams) that you must weight out for all of the substances you have been requested to present for evaluation.
- Don't forget to account for weights of your cup! You will need to get a tare weight before adding the substance.

Clean up everything you used when you are finished.

Earn EXTRA CREDIT (5 pts)

Bring me 30.1 x 10²¹ molecules of Magnesium Sulfate heptahydrate.in a white cup.

NOTE: There will be **ONE** RE-DO after school if you didn't get a good score on the lab. You will need to repeat the entire lab with a new worksheet.

Mole Lab Worksheet

Group # 1	NAME(s):						
A. Measure out 1.25 moles of NaCl in a green cup Show work:	w/i 2% 5	w/i 5% 3	w/l 10% 2.5	you tried 1			
B. Put 4.52 x 10 ²⁴ molecules of water in a blue, dry show work:	cup 5	3	2.5	1			
C. Hand your instructor 6.13 x 10 ²² atoms Al Show work:	5	3	2.5	1			
D. Measure out 0.0485 moles of ammonium sulfate in a purple cup Show work:	5	3	2.5	1			

Mole Lab Worksheet

Group # 2	NAME(s):					
A. Measure out 1.35 moles of NaCl in a green cup Show work:	w/i 2% 5	w/i 5% 3	w/l 10% 2.5	you tried 1		
B. Put 4.32 x 10 ²⁴ molecules of water in a blue,, dry Show work:	v cup 5	3	2.5	1		
C. Hand your instructor 6.69 x 10 ²² atoms Al Show work:	5	3	2.5	1		
D. Measure out 0.0472 moles of ammonium sulfate in a purple cup Show work:	e 5	3	2.5	1		

Mole Lab Worksheet

Group # 3	NAME(s):					
A. Measure out 1.51 moles of NaCl in a green cup Show work:	w/i 2% 5	w/i 5% 3	w/l 10% 2.5	you tried 1		
B. Put 4.12 x 10 ²⁴ molecules of water in a blue, dry Show work:	cup 5	3	2.5	1		
C. Hand your instructor 6.86 x 10 ²² atoms Al Show work:	5	3	2.5	1		
D. Measure out 0.0468 moles of ammonium sulfate in a purple cup Show work:	5	3	2.5	1		

Mole Lab Worksheet

Group # 4	NAME(s):					
A. Measure out 1.65 moles of NaCl in a green cup Show work:	w/i 2% 5	w/i 5% 4	w/l 10% 2.5	you tried 1		
B. Put 3.93 x 10 ²⁴ molecules of water in a blue, dry Show work:	[,] cup 5	4	2.5	1		
C. Hand your instructor 7.02 x 10 ²² atoms Al Show work:	5	4	2.5	1		
D. Measure out 0.0459 moles of ammonium sulfate in a purple cup Show work:	5	4	2.5	1		

Mole Lab Worksheet

Group # 5	NAME(s):					
A. Measure out 1.81 moles of NaCl in a green cup Show work:	w/i 2% 5	w/i 5% 4	w/l 10% 2.5	you tried 1		
B. Put 3.76 x 10 ²⁴ molecules of water in a blue, dry Show work:	cup 5	4	2.5	1		
C. Hand your instructor 7.25 x 10 ²² atoms Al Show work:	5	4	2.5	1		
D. Measure out 0.0447 moles of ammonium sulfate in a purple cup Show work:	5	4	2.5	1		

Mole Lab Worksheet

Group # 6	NAME(s):					
A. Measure out 1.95 moles of NaCl in a green cup Show work:	w/i 2% 5	w/i 5% 4	w/l 10% 2.5	you tried 1		
B. Put 3.61 x 10 ²⁴ molecules of water in a blue, dry Show work:	cup 5	4	2.5	1		
C. Hand your instructor 7.39 x 10 ²³ atoms Al Show work:	5	4	2.5	1		
D. Measure out 0.0437 moles of ammonium sulfate in a purple cup Show work:	5	4	2.5	1		

Instructor's Key:

		А	g	В	g	С	g	D	g
1		1.25	73.06	4.52 x 10 ²⁴	135.30	6.13 x 10 ²²	2.75	0.0485	6.24
	5	71.60	74.52	132.58	138.01	2.70	2.81	6.12	6.36
	4	69.41	76.72	128.54	142.07	2.61	2.89	5.93	6.55
	2.5	65.76	80.37	121.77	148.83	2.48	3.03	5.62	6.86
2		1.35	78.91	4.32 x 10 ²⁴	129.31	6.69 x 10 ²²	3.00	0.0472	6.19
	5	77.33	80.49	128.72	131.90	2.94	3.06	6.07	6.31
	4	74.96	82.85	122.84	135.78	2.85	3.15	5.88	6.5
	2.5	71.02	86.80	116.38	142.24	2.70	3.30	5.57	6.81
3		1.51	88.26	4.12 x 10 ²⁴	123.33	6.86 x 10 ²²	3.07	0.0468	3.07
	5	86.49	90.02	120.86	125.80	3.01	3.13	3.01	3.13
	4	83.85	92.67	117.16	129.50	2.92	3.22	2.92	3.22
	2.5	79.43	97.09	111.00	135.66	2.76	3.38	2.76	3.38
4		1.65	96.44	3.93 x 10 ²⁴	117.64	7.02 x 10 ²²	3.15	0.0459	3.15
	5	94.51	98.37	115.29	116.00	3.09	3.21	3.09	3.21
	4	91.62	101.26	111.76	123.52	2.99	3.31	2.99	3.31
	2.5	86.80	106.09	105.88	129.40	2.84	3.47	2.84	3.47
5		1.81	105.79	3.76 x 10 ²⁴	112.55	7.25 x 10 ²²	3.25	0.0447	5.91
	5	103.68	107.91	110.30	114.80	3.19	3.32	5.79	6.03
	4	100.50	111.08	106.92	118.18	3.09	3.41	5.61	6.21
	2.5	95.22	116.37	101.30	123.81	2.93	3.58	5.32	6.50
6		1.95	113.98	3.61 x 10 ²⁴	108.06	7.39 x 10 ²³	3.30	0.0437	5.78
	5	111.70	116.26	105.90	110.22	3.23	3.37	5.66	5.90
	4	108.28	119.68	102.66	113.46	3.14	3.47	5.49	6.07
	2.5	102.58	125.38	97.25	118.87	2.97	3.63	5.20	6.36