

Grams, Moles and Molecular Mass Worksheet

Reference: Tom Stretton Chemistry

1. What is the mass of 0.100 mol of each of the substances given below:
 - (a) Sodium carbonate, Na_2CO_3
 - (b) Ammonium tetraborate, $(\text{NH}_4)_2\text{B}_4\text{O}_7$
 - (c) Calcium cyclamate, $\text{Ca}(\text{C}_6\text{H}_{12}\text{NSO}_3)_2$
2. How many moles of sodium nitrate are in 1.70 grams of sodium nitrate, NaNO_3 , a substance used in fertilizers and to make gunpowder.
3. Ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$, is a fertilizer used to supply both nitrogen and sulphur. How many grams of ammonium sulphate are in 35.8 moles of $(\text{NH}_4)_2\text{SO}_4$.
4. A 0.500 mol sample of table sugar, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, weighs how many grams?
5. A solution of zinc chloride, ZnCl_2 , in water is used to soak the ends of wooden fenceposts to preserve them from rotting while they are stuck in the ground. One ratio used is 840 grams ZnCl_2 to 4 L water. How many moles of ZnCl_2 are in 840 grams of ZnCl_2 ?
6. In the early 1970s, thallium sulphate, Tl_2SO_4 , a powerful poison, was illegally used in poison baits to control predators such as coyotes on western rangelands. Hundreds of eagles died after taking these baits. A 1.00 kilogram can of Tl_2SO_4 contains how many moles of this compound?
7. Borazon, one crystalline form of boron nitride, BN , is very likely the hardest of all substances. If one sample contains 3.02×10^{23} atoms of boron, how many atoms and how many grams of nitrogen are also in this sample?
8. If iodine is not in a person's diet, a thyroid condition called goitre develops. Iodized salt is all that it takes to prevent this disfiguring condition. Calcium iodate, $\text{Ca}(\text{IO}_3)_2$, is added to table salt to make iodized salt. How many atoms of iodine are in 0.500 moles of $\text{Ca}(\text{IO}_3)_2$? How many grams of calcium iodate are needed to supply this much iodine?
9. Ammonium carbonate, $(\text{NH}_4)_2\text{CO}_3$, is used as a fertilizer and to manufacture explosives. How many atoms of nitrogen are in 0.665 moles of this substance? How many grams of ammonium nitrate supply this much nitrogen?
10. Sodium perborate, NaBO_3 , is present in "oxygen bleach". It acts by releasing oxygen, which has bleaching ability. How many grams of sodium perborate are in 4.65 moles of NaBO_3 ?
11. Barium sulphate, BaSO_4 , is given to patients as a thick slurry in flavoured water before X-rays are taken of the intestinal tract. The barium blocks the X-rays, and the tract therefore casts a shadow that is seen on the x-ray film. How many grams are in 0.568 mole of barium