

TUTORIAL:

STOICHIOMETRY

Bilangan Avogadro dan Massa Molar

1. How many atoms are there in 5.10 moles of sulfur (S)?
2. How many moles of cobalt (Co) atoms are there in 6.00×10^9 (6 billion) Co atoms?
3. How many moles of calcium (Ca) atoms are in 77.4 g of Ca?

Persen Komposisi dan Rumus Molekul

4. Monosodium glutamate (MSG), a food-flavor enhancer, has been blamed for “Chinese restaurant syndrome,” the symptoms of which are headaches and chest pains. MSG has the following composition by mass: 35.51 percent C, 4.77 percent H, 37.85 percent O, 8.29 percent N, and 13.60 percent Na. What is its molecular formula if its molar mass is about 169 g?

Jumlah Pereaksi dan Produk

5. When potassium cyanide (KCN) reacts with acids, a deadly poisonous gas, hydrogen cyanide (HCN), is given off. Here is the equation:



If a sample of 0.140 g of KCN is treated with an excess of HCl, calculate the amount of HCN formed, in grams.

Pereaksi Pembatas

6. The depletion of ozone (O_3) in the stratosphere has been a matter of great concern among scientists in recent years. It is believed that ozone can react with nitric oxide (NO) that is discharged from the high-altitude jet plane, the SST. The reaction is



If 0.740 g of O_3 reacts with 0.670 g of NO , how many grams of NO_2 will be produced? Which compound is the limiting reagent? Calculate the number of moles of the excess reagent remaining at the end of the reaction.

Persen Hasil

7. Nitroglycerin ($\text{C}_3\text{H}_5\text{N}_3\text{O}_9$) is a powerful explosive. Its decomposition can be represented by



This reaction generates a large amount of heat and many gaseous products. It is the sudden formation of these gases, together with their rapid expansion, that produces the explosion. (a) What is the maximum amount of O_2 in grams that can be obtained from 2.00×10^2 g of nitroglycerin? (b) Calculate the percent yield in this reaction if the amount of O_2 generated is found to be 6.55 g.