

Name \_\_\_\_\_ period \_\_\_\_ date \_\_\_\_\_

**Calculations involving molecular mass of compounds**

1. Aspartame is an artificial sweetener that is 160 times sweeter than sucrose (table sugar) when dissolved in water. It is marketed as Nutra-Sweet. The molecular formula for aspartame is  $C_{14}H_{18}N_2O_5$ .

- a) Calculate the molar mass of aspartame.
  
  
  
  
  
  
  
  
  
  
- b) How many moles of molecules are present in 10.0 g of aspartame?
  
  
  
  
  
  
  
  
  
  
- c) Calculate the mass in grams of 1.56 mol aspartame.
  
  
  
  
  
  
  
  
  
  
- d) How many molecules are in 5.0 mg aspartame?
  
  
  
  
  
  
  
  
  
  
- e) How many atoms of nitrogen are in 1.2 g aspartame?
  
  
  
  
  
  
  
  
  
  
- f) What is the mass in grams of  $1.0 \times 10^9$  molecules of aspartame?
  
  
  
  
  
  
  
  
  
  
- g) What is the mass in grams of one molecule of aspartame?

2. Dimethylnitrosamine,  $(\text{CH}_3)_2\text{N}_2\text{O}$  is a carcinogenic (cancer causing) substance that may be formed in foods, beverages or gastric juices from the reaction of nitrite ion (used as a food preservative) with other substances.

- a) What is the molar mass of dimethylnitrosamine?
- b) How many moles of  $(\text{CH}_3)_2\text{N}_2\text{O}$  molecules are present in 250 mg?
- c) What is the mass of 0.050 mole dimethylnitrosamine?
- d) How many atoms of hydrogen are in 1.0 mole dimethylnitrosamine?
- e) What is the mass of  $1.0 \times 10^6$  molecules of dimethylnitrosamine?
- f) What is the mass in grams of one molecule of dimethylnitrosamine?