The following pages test your ability to work limiting reactant problems.

Usage:

• If necessary, select "Full Screen" format from View menu (exit "Full Screen" format by pressing "Esc" key).

- All questions are multiple choice. *Roll* mouse over answer for feedback.
- Move to new page using Page Up/Down keys or Return/Shift-Return.

Problem #1

How many atoms are there in a 15.4 g key, assuming the key is solid iron?

- a. 1.66 x 10⁻²³
- b. 5.18×10^{26}
- c. 3.36×10^{25}
- d. 5.18×10^{-26}
- e. 1.66×10^{23}
- f. I don't know

Problem #2

Does the following picture accurately represent the following reaction?



YES ! NO!

A. Is the following reaction for the combustion of glycerol, $C_3H_8O_3$, with oxygen to form carbon dioxide and water correctly balanced?

$$C_{3}H_{8}O_{3} + O_{2} + O_{2} + O_{2}O_{2} + O_{2}O_{2}$$

YES! NO!

B. When 4 moles of glycerol react with 6 moles of oxygen, which is used up first?

Glycerol! Oxygen!

A contributing factor in the nuclear reactor accident at Three Mile Island was the formation of a hydrogen bubble. This hydrogen bubble impeded the flow of cooling water and compounded the overheating problem in the reactor. It has been established that the following reaction was the source of the hydrogen:

$$2 H_2 O_{(g)} + Zr_{(s)} - ZrO_{2(s)} + 2 H_{2(g)}$$

If 4500 g of Zr metal is reacted with 1.5×10^4 g of water what is the limiting reactant?

- a. Zr
- b. H_2O
- c. ZrO_2

Problem #5

Referring to problem 4, how much hydrogen can be produced in the reaction above?

- a. 99 g
- b. 200 g
- c. 49 g
- d. 1700 g
- e. 1.5 x10⁴