

Part II: Short Answer Questions. Write a brief, but complete answer to each question, confining your answer to the space provided.

(8) 1. (a) How does the splitting of a large nucleus into smaller ones produce energy?

When a nucleus splits it produces smaller fragments and some neutrons. During this process a small fraction of the matter is converted to energy.

(b) What determines how much energy is produced in this process?

The amount of energy produced during nuclear fission is determined by the amount of matter converted to energy by the formula:

$$E = MC^2$$

(8) 2. Neither SO_x nor NO_x produce protons, yet they both contribute to acid rain. Describe how this process occurs.

Both sulfur oxides (SO_x) and nitrogen oxides (NO_x) react with water to produce acids.

Sulfur oxides produce sulfuric acid and nitrogen oxides produce nitric acid.

These acids are much stronger acids than the carbonic acid produced from carbon dioxide

Strong acids release more protons which makes the rain water more acidic.

(9) 3. List **three significant** issues that must be overcome if nuclear power is to make a substantial contribution to the future energy needs in this country.

For nuclear power to meet the future energy needs in this country this industry must:

- 1. develop safe storage methods for the high level radioactive waste.*
- 2. overcome its unsafe image by educating the public.*
- 3. implement new technologies to improve safety.*