1. Approximately 250,000 tons of coal are burned each year at the City of Ames Power Plant. The coal has a 0.21% sulfur content and a 13.5% ash content. What would be the average daily output (in kg/d) of sulfur dioxide (SO₂) assuming that 13.5% of the sulfur content of the coal ends up in the ash (i.e. 13.5% of S is unreacted) and the rest is released in the stack gas?

2. Assuming that the remainder of the coal is essentially carbon, how much oxygen would be consumed per day in the reactions with coal? Express your results in both mass (kg/d) and volume (m³/d) units.

3. As a rough approximation, the average oxygen content of dry air is about 21% by volume. If 20% excess air is used in the combustion process, how much air will be required each day?

4. What would be the concentration of SO₂ in the stack gas if no pollution control equipment is used? Calculate your result on both a mass (g/m³) and volume (ppm) basis.

5. How many tons of CO₂ are produced each year?