
The Magic of Ceramics -- Study Guide, Chapter 13

1. What was the primary goal of the Clean Air Act of 1970?
2. Describe the ceramic honeycomb for an early catalytic converter.
3. Compare the exhaust emissions of a 1968 automobile (before the catalytic converter) with those of a Tier 1 automobile.
4. How much have total tailpipe emissions been decreased between 1965 and 2010?
5. What are the health problems associated with diesel vehicle emissions?
6. What is being done to reduce pollution from diesel vehicles?
7. How are ceramics involved in water and sewage treatment?
8. What are the roles of ceramics in hydroelectric power generation?
9. How much concrete was required for the Three Gorges Dam in China?
10. Describe the growth in the use of wind to generate electricity.

11. How are ceramics involved in wind energy?
12. The amount of energy reaching the earth from the sun is enormous, yet we are only converting a very small percentage to clean electric power. Why?
13. What is a p-n junction?
14. Explain how a simple silicon crystalline solar cell works.
15. What are the advantages of an amorphous silicon solar cell?
16. What are the disadvantages?
17. How can a layered amorphous solar cell achieve higher efficiency?
18. Identify two more thin film solar cell approaches. What are their advantages and disadvantages?
19. Describe a tandem solar cell. How can it achieve higher efficiency than single-junction cells?