The Magic of Ceramics -- Study Guide, Chapter 10

1. Why do we need materials that can withstand high temperatures?

2. What are the steps in converting metal from mined ore to a finished product?

3. How are ceramics important in preparing ore for extraction of the metal? What are the special characteristics of the ceramics that make them useful?

4. When aluminum oxide is separated into aluminum and oxygen during electrolysis, what happens to the oxygen?

5. What are the benefits of recycling aluminum?

6. What is the temperature inside a modern blast furnace?

7. How does a basic oxygen furnace convert iron to steel?

8. What novel method is used to make ceramic filters for screening out debris in molten metals?

9. How has the ceramic oxygen sensor improved steel making?

10. What is the purpose of a heat exchanger?

11. How are metals formed into complex shapes?

12. What might be an advantage of extruding a metal while hot rather than trying to work it into a shape at a low temperature?

13. Most metal parts require heat treating. What are some important roles of ceramics in heat treating?

14. How large is a furnace for making window glass?

15. How much glass can be produced per day in such a furnace?

16. How are ceramics used in conjunction with a catalyst in chemicals and petroleum processing?

17. How have refractory brick linings been replaced since 1960 to speed up the firing cycle and to reduce energy consumption?

18. About how many high temperature ceramic tiles cover the surface of the Space Shuttle?

19. What special characteristics have been designed into Space Shuttle tiles?