

Tutorial N°2. Glass and ceramics

Exercise 1

- 1. What are ceramic materials?**
2. Explain the concept of ceramic materials and their basic properties.
- 3. What are the types of ceramic materials based on their chemical composition?**
4. Compare metallic ceramics and non-metallic ceramics.
- 5. How are ceramic materials classified in terms of mechanical properties?**
6. Discuss brittle, ductile, and hard ceramics.
- 7. What is the difference between traditional ceramics and engineering ceramics?**
8. Explain the differences in composition and applications of each.
- 9. How are ceramic materials classified based on the preparation method?**
10. Mention different preparation methods such as casting, pressing, and rolling.
- 11. What is the role of calcination in the manufacturing of ceramic materials?**
12. Explain the calcination process and its effect on ceramic properties.
- 13. What are advanced ceramics?**
14. Provide examples of advanced ceramics and explain their applications in modern industry.
- 15. How does temperature affect the properties of ceramic materials?**
16. Discuss the impact of high temperatures on mechanical and thermal properties.
- 17. What ceramic materials are used in medical applications?**
18. List types of ceramics used in bone implants or prosthetics.
- 19. What is the relationship between ceramic composition and manufacturing method in determining its properties?**
20. Discuss how chemical composition and preparation methods influence the final properties of ceramics.

Exercise 2

1. Ordinary glass, or soda-lime glass, accounts for about 90% of glass production due to its low cost and ease of manufacturing. List its main components.
2. What is the primary role of boron oxide (B_2O_3) in glass?