

NAN 242

Midterm 2 - Sample Questions

1. What are the two key physical processes that are used in sputtering?
2. What is a plasma? How can it be created?
3. Why wouldn't you want too low a pressure in a plasma?
4. List the basic steps in sputtering.
5. Draw a typical DC sputtering chamber and identify the components.
6. Why doesn't DC sputtering work for an insulating film? How do you overcome this?
7. Explain self-biasing in RF plasmas.
8. How does magnetron sputtering improve sputtering efficiency?
9. Draw a simple CVD reaction chamber and identify the processes.
10. What are the two growth types in CVD?
11. Which of them is more suitable to epitaxial film growth?
12. Describe the important aspects of a tube CVD reactor.
13. What are the advantages of LPCVD?
14. What are the 6 steps of thin film growth?
15. Which process has a larger energy barrier, physisorption or chemisorption?
16. What are the three interfaces that affect heterogeneous nucleation? Which one of them decreases the Gibb's Free Energy of the substrate-film system as the nucleus grows larger?
17. Which growth mechanism is most suitable for uniform film growth?
18. Describe Ostwald Ripening.
19. If the substrate temperature is a tenth of the melting temperature of the substrate, what would the resulting film look like?
20. What type of epitaxial growth is more likely in a very thin film growing on an unmatched substrate?
21. Why doesn't Silicon emit light efficiently?
22. Describe liquid phase epitaxy.
23. What are the advantages of MBE compared to MOCVD?