

EXERCISE 8

Exercise 1: Make a comparative table of advantages/disadvantages of chemical vapor deposition (CVD) techniques vs physical vapor deposition (PVD) techniques. Parameters to compare: sticking coefficient, deposition rate, conformality of the deposition, range of materials that can be deposited, safety, upscaling, typical application in industry.

Exercise 2: Read the first two pages of the article "Sheath impedance effects in very high frequency plasma experiments"¹ and answer the following questions:

- a) What did they measure?
- b) What is the advantage of VHF and for which application is it used?

Exercise 3:

- a) Using the structure-zone model developed by Thornton (see the article "The microstructure of sputter deposited coatings"²), list the main causes of void formation in sputtered thin films during growth.
- b) How can we exploit the oblique deposition during evaporation or sputtering?
- c) What are the advantages of sputtering deposition vs evaporation?

Remarks: The papers mentioned above should be provided to you by EPFL e.g. via the homepages www.isiknowledge.com, www.sciencedirect.com or directly via the homepages of the publishers. Otherwise you can fetch them from the moodle as well.

¹W. Schwarzenbach, A. A. Howling, M. Fivaz et al, J. Vac. Sci. Technol. A **14**, 132 (1996)

²J. A. Thornton, J. Vac. Sci. Technol. A **4**, 3059 (1986)