

08.33.40 Hlutjónað rafgas

Kennsla:	Jón Tómas Guðmundsson, tumi@hi.is
Kennslubók:	M. A. Lieberman and A. J. Lichtenberg, <i>Principles of Plasma Discharges and Materials Processing</i> , 2nd ed., John Wiley & Sons, 2005
Heimasíða:	www.raunvis.hi.is/~tumi/rafgas07.html
Fyrirlestrar:	Tvisvar í viku Þriðjudagar 8:20 – 9:50 Fimmtudagar 10:00 – 11:30
Heimadæmi:	Verða sett fyrir vikulega. Athuga ber að þau gilda 50 % af lokaekunn.
Einkunnargjöf:	Heimadæmi 50 % Lokapróf 50 %

Dagur	Viðfangsefni	Leseefni
1. Introduction		
28. ágúst	Materials processing	1.1
30. ágúst	Plasma and sheaths, discharges symbols and units	1.2 – 1.4
2. Basic plasma equations and equilibrium		
4. september	Introduction, field equations, current and voltage	2.1 – 2.2
6. september	Conservation equations	2.3
6. september	Equilibrium properties	2.4
3. Atomic collisions		
11. september	Basic concepts, collision dynamics	3.1 – 3.2
13. september	Elastic scattering	3.3
18. september	Inelastic collisions, average over distributions, surface effects	3.4 – 3.5
4. Plasma dynamics		
20. september	Basic motions	4.1
25. september	Nonmagnetized plasma dynamics	4.2
5. Diffusion and transport		
27. september	Basic relations	5.1
27. september	Diffusion solutions	5.2
27. september	Low pressure solutions	5.3
6. DC sheaths		
9. october	Basic concept and equations, Bohm sheath criterion	6.1 – 6.2
11. october	High voltage sheath	6.3
16. october	Electronegative sheaths, collisional sheath	6.4 – 6.5
18. october	Electrostatic probe diagnostics	6.6

Dagur	Viðfangsefni	Leseefni
	7. Chemical reactions and equilibrium	
23. october	Introduction, energy and enthalphy, entropy and Gibbs free energy	7.1 – 7.3
25. october	Chemical equilibrium	7.4
30. october	Heterogeneous equilibrium	7.5
	8. Molecular collisions	
1. november	Introduction, molecular structure, electron collisions with molecules	8.1 – 8.3
6. november	Heavy particle collisions, reaction rates and detailed balancing	8.4 – 8.5
8. november	Optical emission and actinometry	8.6
	9. Chemical kinetics and surface processes	
13. november	Elementary reactions	9.1
13. november	Gas phase kinetics	9.2
15. november	Surface processes	9.3
15. november	Surface kinetics	9.4
	10. Particle and energy balance in discharges	
20. november	Introduction, electropositive plasma equilibrium	10.1 – 10.2
20. november	Electronegative discharge equilibrium	10.3
	11. Capacitive discharges	
22. november	Homogenous model	11.1
22. november	Inhomogenous model	11.2
27. november	Asymmetric discharges and matching networks	11.4, 11.6, 11.8
	12. Inductive discharges	
29. november	High density low pressure discharges	12.1
29. november	Operating regimes, planar coil configuration	12.2 – 12.3
	13. Wave heated discharges	
1. desember	Electron cyclotron resonance discharge	13.1

Dagur	Viðfangsefni	Lesefni
	14. DC discharges	
4. december	Qualitative charectistics of glow discharges	14.1
4. december	Analysis of the positive column	14.2
4. december	Planar magnetron discharges	14.5 – 14.6
	15. Etching	
6. december	Etch requirements and processes	15.1
6. december	Etching kinetics	15.2
6. december	Halogen atom etching of silicon	15.3
	16. Deposition and Implantation	
11. december	Introduction, plasma enhanced chemical vapor deposition	16.1 – 16.2
11. december	Sputter deposition	16.3
11. december	Plasma immersion ion implantation	16.4

Kaflar í töflu miðast við M. A. Lieberman and A. J. Lichtenberg, *Principles of Plasma Discharges and Materials Processing*, 2nd ed., John Wiley & Sons, 2005