Physical chemistry of surfaces

Spring semester, 2020

During the exam you may use a set of 10 equations. It should be hand written with your name and neptun code. No other info (e.g., meaning of the symbols) is allowed on the paper. Phones are not allowed for any purpose.

TOPICS
1. Classification of the interfaces
2. Spontaneous routes for reduction of the excess surface energy ((Segregation, adsorption, wetting)
3. Particle size distribution
4. What are the terms/quantities to characterize a high surface area (porous) system
5. The quantitative description of adsorption
6. Molecular interactions involved in adsorption
7. Static techniques to measure gas adsorption
8. Dynamic method to measure gas adsorption
9. Classification of the gas adsorption isotherms
10. The source of adsorption hysteresis
11. The Langmuir model and its application to evaluate gas adsorption data
12. The BET model and its application to evaluate gas adsorption data
13. The Dubinin-Radushkevich model and its application to evaluate gas adsorption data
14. Possibilities to characterize the strength of adsorption (K, C, isothermal heat of adsorption)
15. The Kelvin equation and its use for the morphological characterisation (pore size distribution) of adsorbent from gas adsorption isotherms
16. The derivation of specific surface area from gas adsorption data
17. Typical interactions defining the adsorption in binary solution/solid systems
18. How do you determine adsorption isotherms for solid/liquid interfaces
19. Types of adsorption isotherms for dilute non-electrolytes and weak electrolytes
20. Adsorption in ionic systems
21. Dynamics of surface processes. The types of diffusion
22. Chemisorption
23. Heterogeneous catalysis and its mechanisms
24. Activated carbon
25. Metal oxide adsorbents