

**Puu-19.3010 Chemistry in Papermaking**

**Exam 5.4.2011**

1. Give examples of at least two of each of the three types of colloids that occur in papermaking processes. What kind of papermaking problems can be solved with help of surface and colloid chemistry?  
*1. Lihakkuat P-A onnet  
2. Lihakkuat polymersit  
3. Lihakkuat kummit*
2. The use of cationic polymers as flocculants and retention aids is often disturbed by dissolved wood polymers in the process water. What are the principal colloidal interactions giving rise to this disturbance and what can be done to reduce this disturbance?
3. In studies of how colloidal material in the circulation water of paper machines tends to deposit on solid surfaces it has been found that a colloid that has coagulated or flocculated to larger aggregates has a lower tendency to form deposits than particles of colloidal size. Explain why. What are the most important forces that bind colloidal particles to surfaces of metal oxides?
4. Describe briefly the principle of AKD sizing of paper (with respect to chemistry, especially surface chemistry). Describe also some negative effects that are related to AKD sizing.
5. In the deinking process it is necessary to use so-called collector chemicals in order to achieve sufficiently efficient removal of the ink particles. Why is it necessary to use such additives? By what mechanism is the most generally used collector chemical, calcium soaps, thought to function?