INTERACTION OF KAOLIN AND MAGNETITE PARTICLES WITH COPPER SURFACES AT DIFFERENT pH VALUES.

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The deposition of particles from flowing suspensions is governed by the combined action of surface interactions and hydrodynamic forces. Among the great number of factors affecting surface interactions the pH plays an important role when aqueous suspensions are concerned. This work reports the results obtained in several deposition experiments carried out with aqueous suspensions of kaolin and magnetite particles, flowing at a velocity of 0.42 m/s, in the pH range 7.5 - 10.5. Copper was chosen as surface of deposition, due to the importance of particle deposits on heat transfer equipment, where copper is widely used.

For each type of particles and pH value two different runs were performed. In one case the pH was kept constant via addition of sodium hydroxide and in the other the controlling medium was sodium carbonate. Each run had a duration of 20 days and at the end the thickness of the deposits was measured by means of a micrometer based device. Zeta potentials and surface tensions of the interacting species were also measured.

The interpretation of the results has been tried by associating the effects predicted by DLVO theory with the action of short range repulsive interactions and hydrodynamic forces acting on the deposited particles.

The better agreement with experimental observations is obtained considering that the interactions take place at constant potential. However, there are some situations of difficult explanation, for which it would be necessary to quantify the hydration forces.

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