

Fluidization at vacuum conditions. A generalized equation for the prediction of minimum fluidization velocity
Llop M.F., Madrid F., Arnaldos J. & Casal J., *Chemical Engineering Science*, 1996, 51/23 (5149-5157). In English.

The hydrodynamical behaviour of fluidized beds at reduced pressures is studied. The minimum fluidization velocity is strongly influenced by pressure, decreasing as pressure increases. The well-known equation of Wen and Yu and two equations proposed for the calculation of u_{mf} at reduced pressures are tested; the comparison with experimental data shows that they can be applied only over restricted pressure ranges. The relationship between flow rate, pressure and pressure drop at conditions ranging from high vacuum to high pressure is analysed for the different flow regimes (molecular, slip, laminar, transition and turbulent). A generalized equation is found which predicts fairly well the value of u_{mf} at vacuum conditions, atmospheric pressure and high pressures.

Modify sealless pumps

Jaskiewicz S.A., *Chemical Engineering World*, 1996, 31/5 (63-65). In English.

There is a general misconception that canned motor pumps can only be used on clean fluids. Such pumps can be used for solids-laden fluids and slurries. Design modifications and equipment alternatives for handling solids are presented. Hard bearings and journals allow solids to pass through the motor section without causing damage. Canned motor pumps that are designed for external circulation can be modified to have filters installed on the recirculations line. Backflushing with a lip seal is recommended. There are canned motor pumps in service that are specifically designed to pump slurries.

Numerical simulation of two-phase flow and solute transport with interphase exchange in porous media

Xiaoyong Zhan, *Communications in Numerical Methods in Engineering*, 1996, 12/7 (433-444). In English.

The development of a numerical method for modelling two-phase flows and solute transport, particularly with interphase exchange in porous media, is presented. The governing equations are derived to describe two immiscible and compressible fluids flows such as water-air and two-phase solute transport with interphase exchange. Application examples are shown to confirm the applicability of the numerical method.

A comparison of numerical models for evaporative two-phase flow in a self-heated porous medium

Kim S.H., *Computers and Fluids*, 1996, 25/8 (699-718). In English.

Two different numerical models using the finite difference method (FDM) for one-component time-dependent two-phase flows in a porous medium are investigated: the iterative four-variable model (I4VM) and the direct three-variable model (D3VM). The former includes the pressure gradient and uses the iterative method to solve a system of flow equations, whereas for the latter, the formulation without the pressure gradient is simultaneously solved using the algorithm for tri-tridiagonal equations of three dependent variables. The steady-state solution as well as the unsteady results obtained by two models are compared only for the low heat generation rate below the dryout limit.

Evaporation of water from agitated freezing slurries at low pressure

Dickey L.C., *Desalination*, 1996, 104/3 (155-163). In English.

In an absorptive vacuum freezing process, water evaporates from the freezing solution and condenses on a cold salt solution. Given sufficient condensing capacity, the evaporation rate will be controlled by the freezing solution vapor pressure. The size of the condensing equipment which matches a given evaporation system can be estimated using rate measurements made with low vapor pressure freezing solutions.

Enhanced reliability for dredge pump cavitation testing

Teijema J., *Dredging and Port Construction*, 1996, 23/6 (9-10). In English.

Problems caused by cavitation in dredge pumps are discussed. Factors influencing pump cavitation testing are outlined. Cavitation curves are measured in a closed loop or in the actual condition. The reliability of measured cavitation curves is affected by the way of adjustment in the suction head and the properties of the test water. Approaches for ensuring the accuracy of pump cavitation testing are described.

(La cavitazione nelle turbine Pelton. (Parte II)) (Cavitation pitting of Pelton turbines. (Part II))

Brivio R. & Zappi O., *Energia Elettrica*, 1996, 73/4 (266-270). In Italian.

The hydraulic laboratory experimental research, performed in cooperation with other European partners and financed by the BRITE project, is described. This research had the purpose to define the parameters and the model/prototype correlations in order to be able to determine the cavitation pitting of Pelton turbines, both from the quality and from the quantity points of view.

Integrated tests for removal of nitric oxide with iron thiochelatate in wet flue gas desulfurization systems

Yao Shi, Littlejohn D. & Shih-Ger Chang, *Environmental Science and Technology*, 1996, 30/11 (3371-3376). In English.

Wet flue gas desulfurization scrubbers can be retrofitted for combining removal of SO_2 and NO_x from flue gas by adding a newly developed iron(II) thiochelatate to limestone slurries. This additive enhances the solubility of NO in limestone slurries by binding NO to form iron nitrosyl thiochelates. The bound NO is then converted to an ammonium ion by iron metal, regenerating the active iron(II) catalyst for continued NO capture. The conditions of the chemical regeneration of iron(II) thiochelatate have been studied. This chemical reduction method is efficient, simple, and cost-effective. Integrated tests of this new iron additive on a bench-scale system have been conducted. The bench-scale test results were used to develop a prediction of the performance of a full-scale spray absorber.