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Oscillatory instability in an almost unstratified mixture with an infinite number of components. (English. Russian original) [Zbl 0948.76541](#)

Fluid Dyn. 32, No. 5, 631-641 (1997); translation from *Izv. Ross. Akad. Nauk, Mekh. Zhidk. Gaza* 1997, No. 5, 24-36 (1997).

Summary: A model of gravitational concentration convection in a mixture with an infinite number of components in the presence of an electric field is constructed in the Oberbeck-Boussinesq approximation. The physicochemical properties of the mixture are such that under the action of the electric field an arbitrary large-scale fluid density stratification can be specified in a plane horizontal layer. For the asymptotic model, in the limiting case of high voltages the absence of mixture (but not fluid) transport and diffusion processes in the vertical direction is demonstrated. The case in which the mixture concentration distributions represent δ -like functions the envelope of whose maxima is constant, i.e., strong small-scale density stratification of the layer without large-scale stratification, is considered. It is found that in this case oscillatory convective instability of the fluid is possible. This instability is numerically investigated in the linear approximation. In addition, for the nonlinear problem, finite-dimension models of the hydrodynamic type are constructed and studied.

MSC:

76E15 Absolute and convective instability and stability in hydrodynamic stability