

Calculation of Spatial Distribution of Binary Solution Component Concentration in Flat Pore with Asymmetrical Wall Potential

Leonid Bulavin, Dmytro Gavryushenko, Volodymyr Sysoev and Pavlo Iakunov^{C, S}
Physics Department, Taras Shevchenko Kyiv National University, Kyiv, Ukraine

To calculate the concentration profile of a binary solution, the lattice model of liquid has been revised. An external field potential has been expanded into functional series as functional of liquid density. The component of the chemical potential caused by the correlation effects has been found as an expansion on direct correlation functions of any order. The first term of this expansion was used in the differential equation of a concentration profile. This equation was applied to a system limited in one direction. The spatial distribution of binary solution component concentration in a flat pore with an asymmetrical wall potential has been found in the result. The results obtained show that far from the critical point the concentration profile is similar to one found in the local approach. It means that the deflection of concentration takes place only on distances that are commensurable with the radius of action of the surface force. But near the critical point the wall potential strongly influences the concentration profile in all volume and the value of the concentration can be different at distances near the correlation radius. The obtained result allows us to compare the properties of liquid in the wall layer with those in the volume.