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Structural factor analysis of small angle X-Ray and neutron scattering curves for apoferritin

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The problem of studying protein molecules in a solution by small-angle scattering is comparatively simple if the protein interaction is not taken into account and the solution is monodisperse. In this case it is possible to solve a structure of an object with a low resolution with the help of ATSAS program package[1].
In this work the comparative analysis of small-angle X-Ray and neutron scattering curves in small angle region for the set of concentrations of a protein apoferritin in a heavy water was done. Measurements were performed at spectrometer Rigaku, MIPT, Dolgoprudny; synchrotron BM-29, ESRF, Grenoble [2] and a small-angle neutron spectrometer YuMO [3,4].
However, the interaction between proteins has been detected even at low concentrations. By the approximation at zero concentration level and obtaining the form-factor the structural factor curve has been obtained. The type of interaction has been defined and the distances between the protein molecules in aggregates have been calculated. The results are being discussed.

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