

# The versatility of the OGBK model describing cationized porphyrines, discotic mesogens or laponites

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The four-parameters Gay-Berne-Kihara (GBK) model was proposed a decade ago to model the interaction between spherocylindrical particles with orientation-dependent attractive interactions. Along these years the model has been widely employed for both oblate and prolate particles, to study the formation of a broad range of structures like solid, nematic or smectic types of columnar phases. But the possibilities of the GBK model have not been completely reported, this study is focused on oblate particles (OGBK), showing that with a proper parametrization, the GBK model is able to describe different features of the interaction of the particles. Hence, attractions and repulsions according to the relative orientation of the particles. With a wise selection of parameters the orientation with the most intense attraction can be selected, and the rest of them tuned accordingly. This opens the door to model different types of molecules and particles with the OGBK model, like cationized porphyrines, discotic mesogens or laponites. Some examples of the structures formed with representative parameterizations are also showed.