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On the Structure of Gum Arabic in Aqueous Solution YAEL DROR, YACHIN COHEN, Technion, Israel, RACHEL YERUSHALMI-ROZEN, Ben-Gurion University, Israel — Gum arabic (GA), a natural composite polysaccharide derived from exudates of *Acacia senegal* and *Acacia seyal* trees, is commonly used in food hydrocolloids. It was shown to effectively disperse carbon nanotubes in water. GA consists mainly of a highly branched polysaccharide and a protein-polysaccharide complex (GAGP) as a minor component. In this work the microstructure of the gum in water was studied by small angle x-ray and neutron scattering combined with cryo-transmission electrons microscopy. An intricate structure is revealed, composed of many spheroidal polysaccharide aggregates and a small amount of large coils of GAGP. Inter-aggregate correlations result in a scattering peak, the spacing of which exhibits a -1/3 power-law dependence on concentration, and which diminishes with increased ionic strength. Changes in the conformation of the large GAGP coils can be followed at very low scattering vectors (q). A coil to rod transition with decreasing concentration is indicated by a change from -2 to -1 in the power-law q-dependence of the scattering intensity. It is suggested that the concentration of the GA in solution affects the structural correlations between the polysaccharide and the GAGP complex, and thus may also affect the surface activity of the gum.

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