Supporting information.

Emulsions stabilized by gum Arabic:

composition and packing within interfacial films

M. Atgié, O. Masbernat, K.Roger*

Laboratoire de Génie Chimique, Université de Toulouse, CNRS, INPT, UPS, Toulouse, France

**to whom correspondence should be addresse: kevin.roger@ensiacet.fr*

This supporting information sections contains:

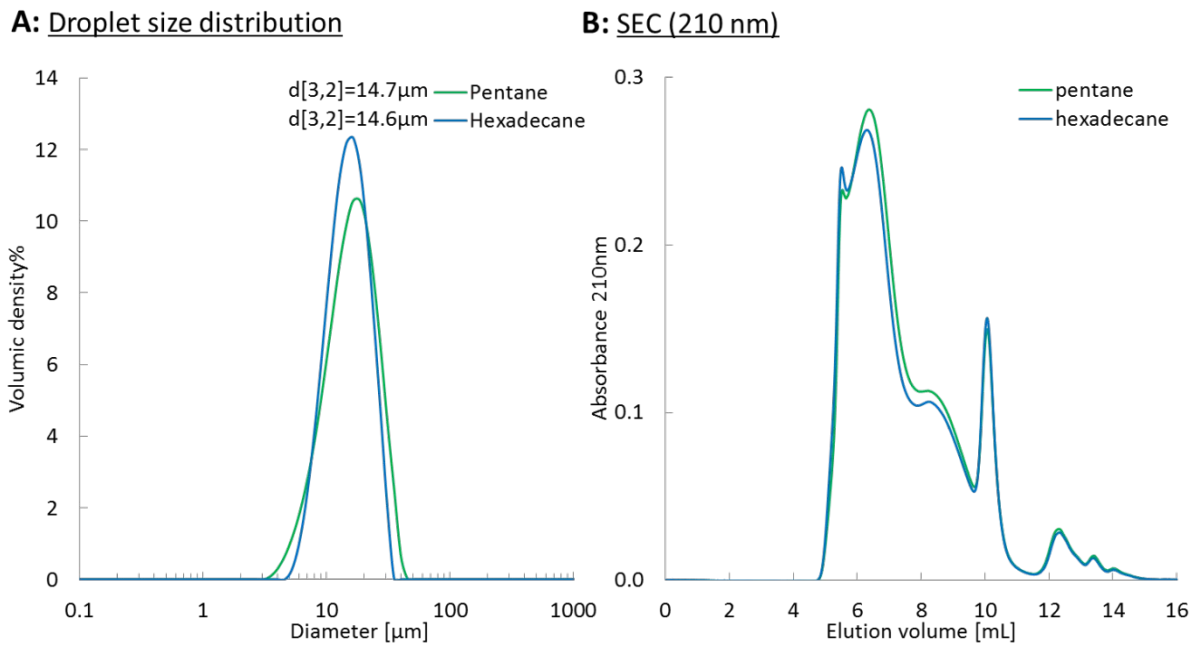

Figure S1: (A) Emulsion size distribution with either pentane or hexadecane as the oil phase using the same formulation, (B) Same emulsions aqueous phase size exclusion chromatograms.

Small differences in interfacial composition may arise from the fact that although both emulsions exhibit similar Sauter diameters, their size distribution are slightly different, with the emulsion with pentane being more polydisperse. Nevertheless, their interfacial composition is nearly the same.

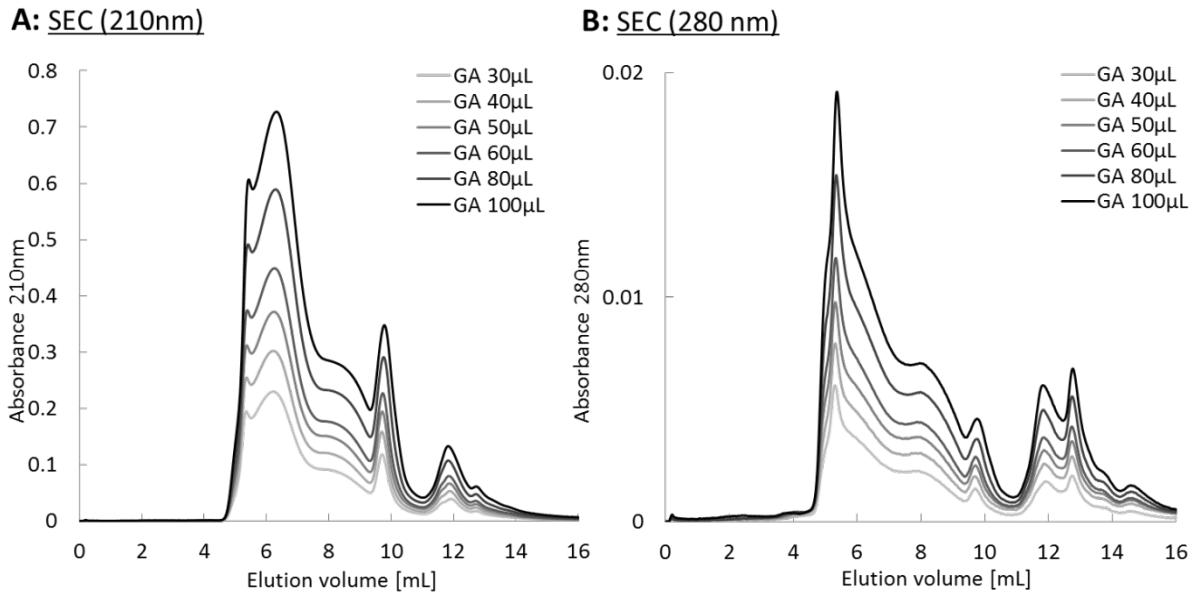

Figure S2: Size exclusion chromatogram of gum Arabic at 30g/L by varying the injected volume. (A) UV detection at 210nm, (B) UV detection at 280nm.

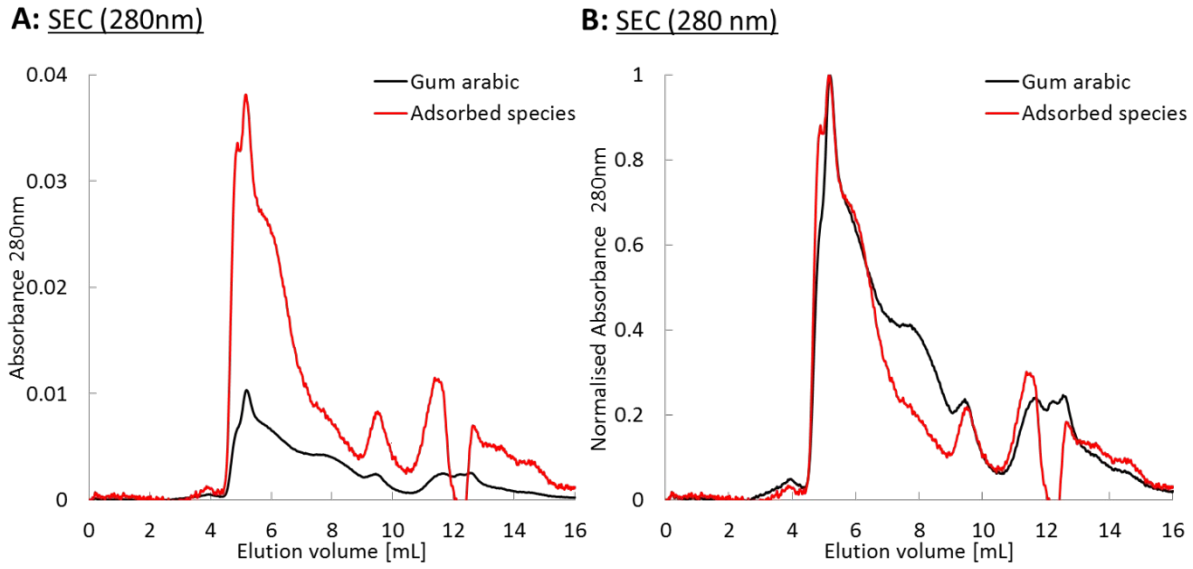

Figure S3: Comparison of gum Arabic (black line) and gum Arabic species adsorbing at oil water interface (red line) size exclusion chromatograms with a UV detection at 280nm. (A): Adsorbed species chromatograms was obtain by subtraction of the non adsorbed species chromatograms to the total gum Arabic chromatogram and brought back to a concentration of 30g/L in order to compare the molecular mass composition with gum Arabic. (B): Both chromatogram from (A) were normalized by the higher intensity in order to compare intensity ratios between different peaks.

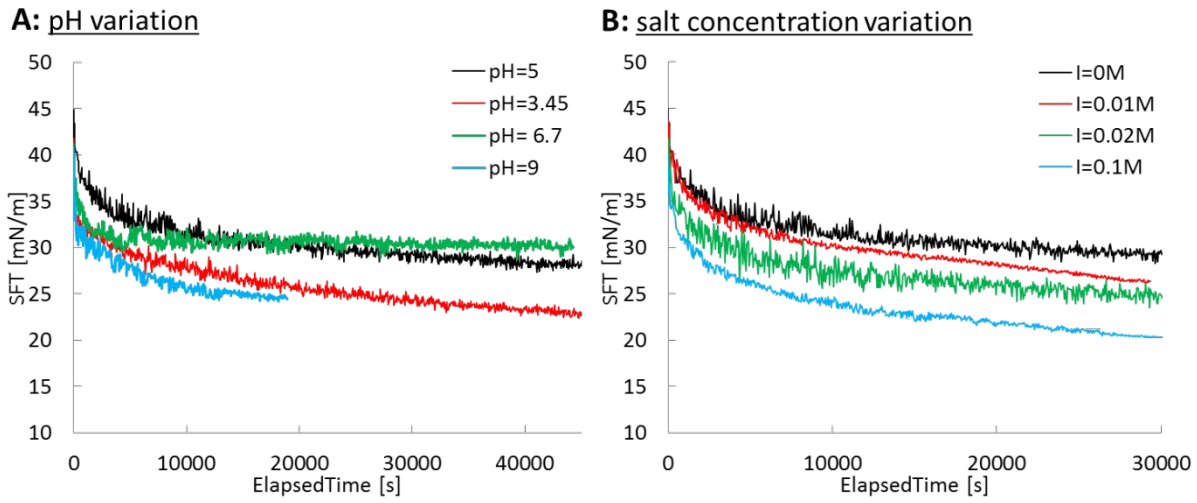

Figure S4: Evolution of interfacial tension between aqueous solution of gum arabic at 0.5wt% and n-hexadecane as a function of time by varying (A) the pH of the aqueous phase or (B) the salinity of the aqueous phase by addition of NaCl.

According to interfacial tension measurements between gum Arabic solutions and hexadecane, physico-chemical parameters appeard to influence the adsorption of gum Arabic species at the interface. This observation might be either the results of an increase in the amount of gum amphiphilic species adsorbed (isotherms of adsorption), or the difference in the type of macromolecules adsorbed (chromatographic analysis) or a combination of both.

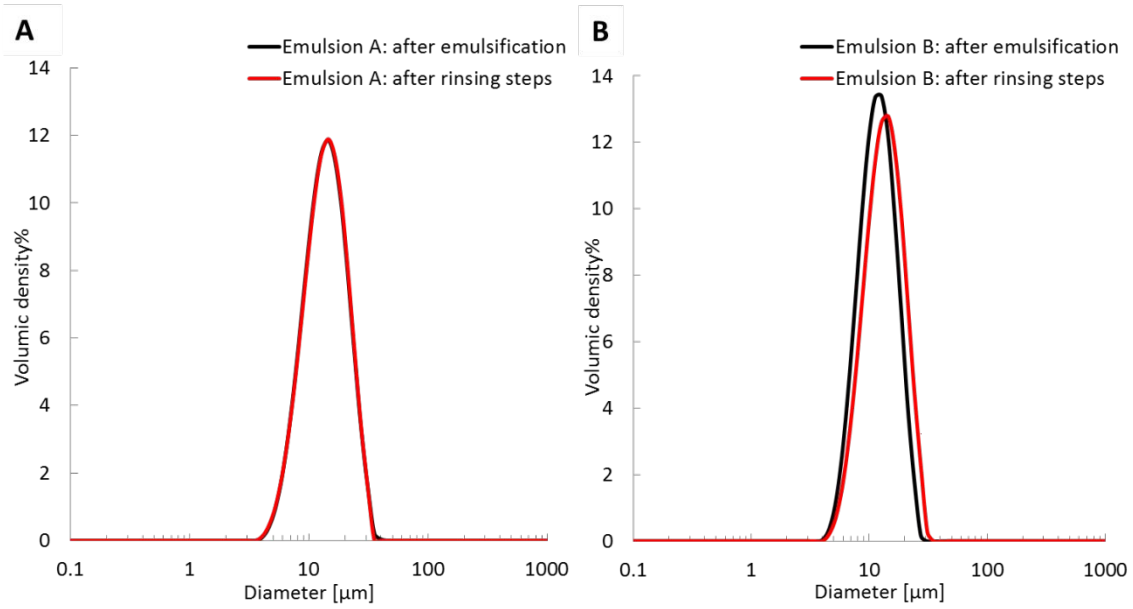

Figure S5: Evolution of the droplets diameters for emulsions A and B during the rinsing procedure

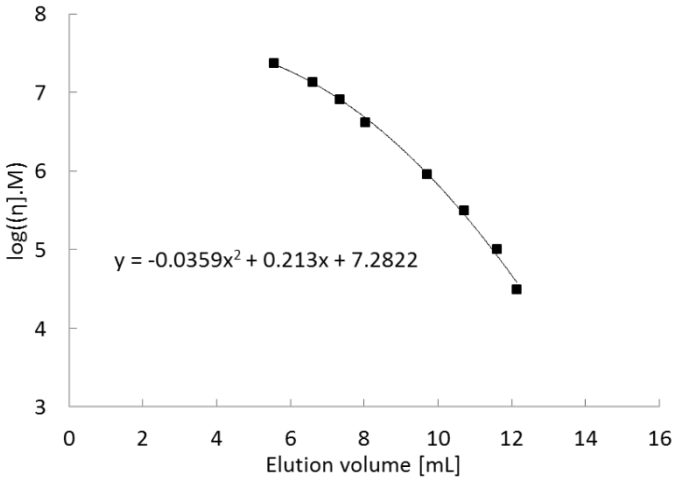

Figure S6: Universal calibration curve (realized with branched dextran of known molecular weight) for size exclusion separation on Biosuite 450Å SEC column (waters) with a flow rate of 0.8mL/min and 0.5M NaCl as the eluant solution.

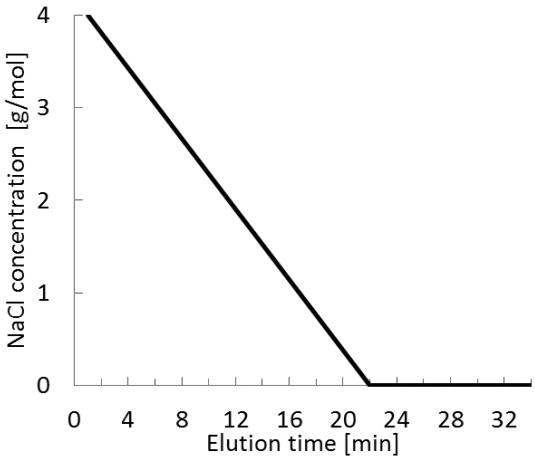

Figure S7: NaCl elution gradient used for hydrophobic interaction chromatographic separation.