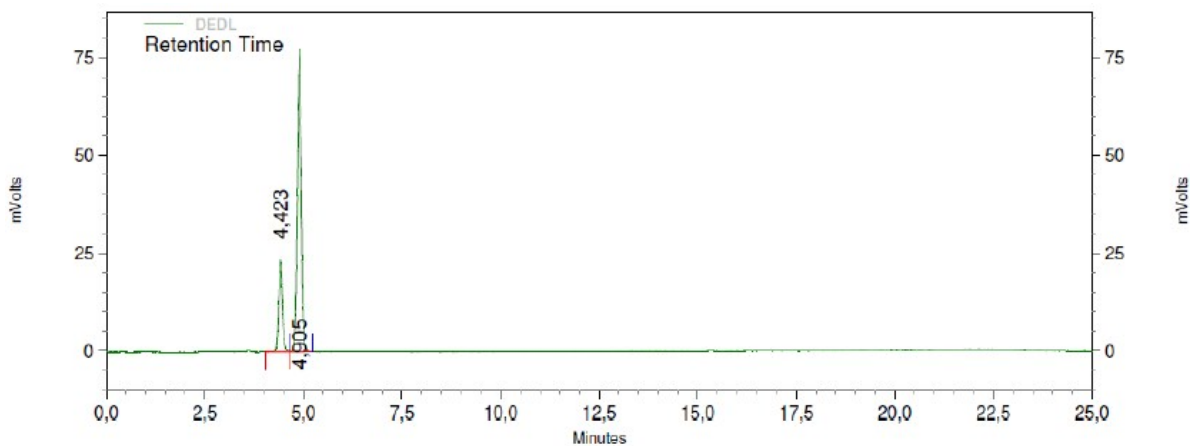
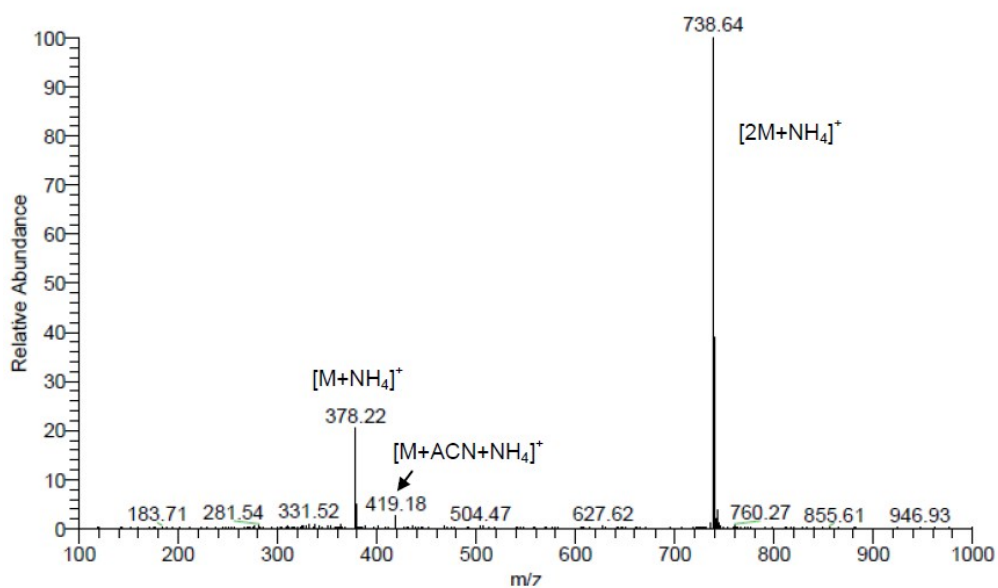


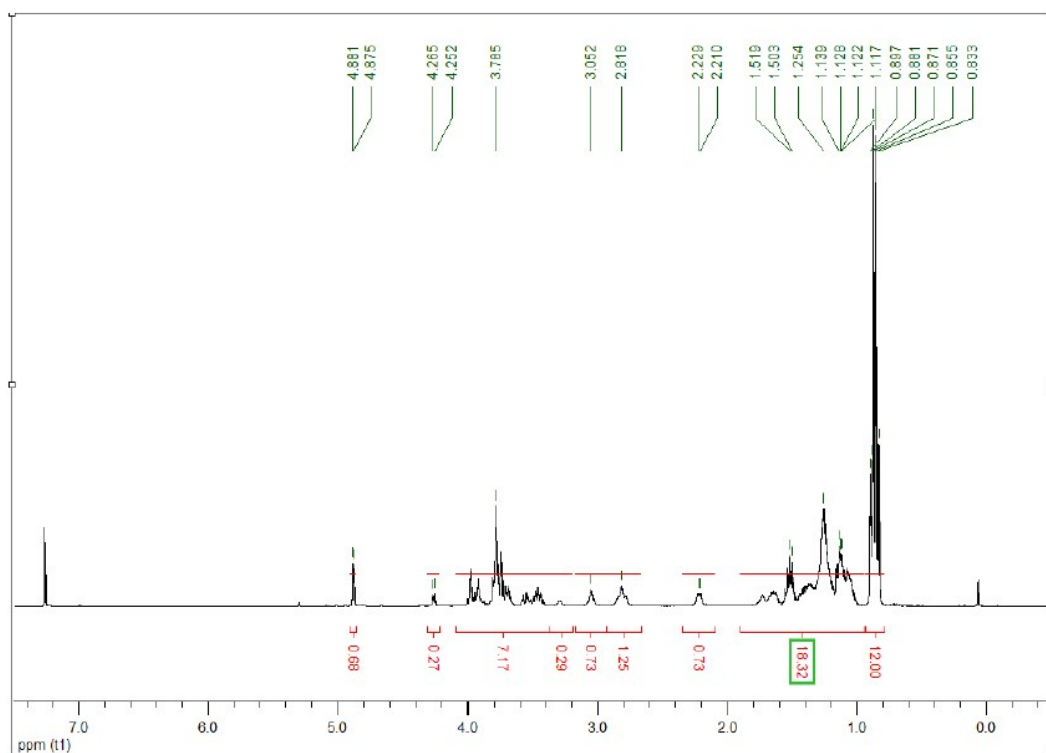
**Supplementary information : Analytical studies, dynamic surface tension and Ternary phase diagram behavior**



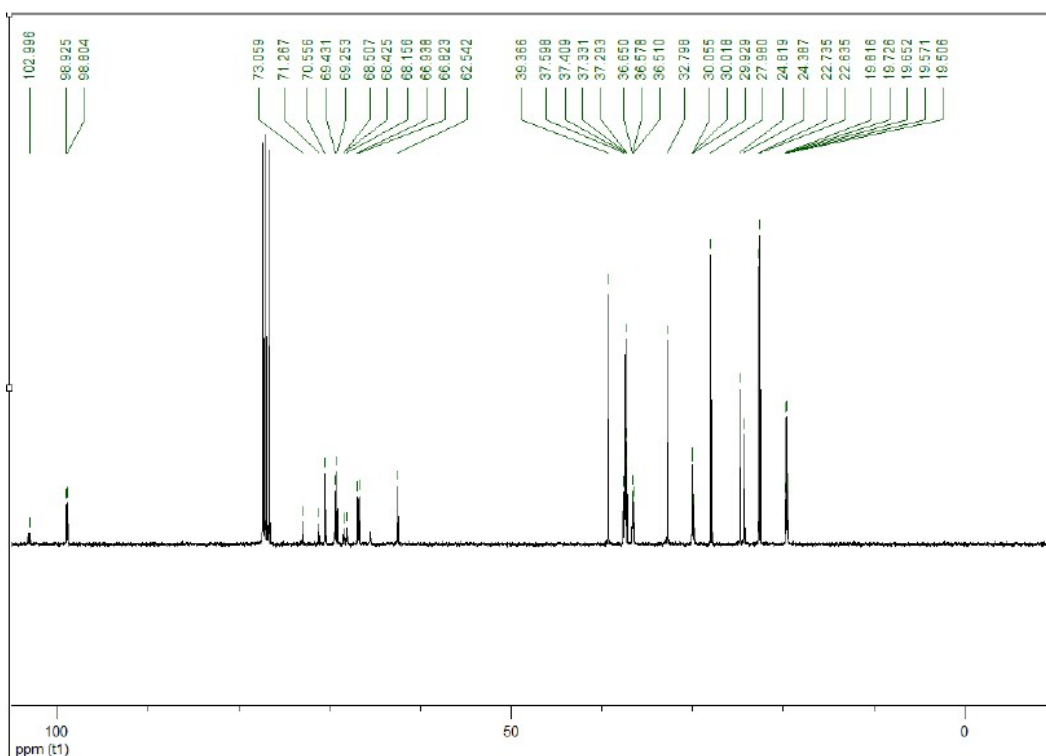
**Figure 1:** HPLC spectrum of HHFA surfactant synthesized with Luna C18 column (3 $\mu$ , 100\*4.6mm), water/acetonitrile (20/80), 30°C, 1mL/min



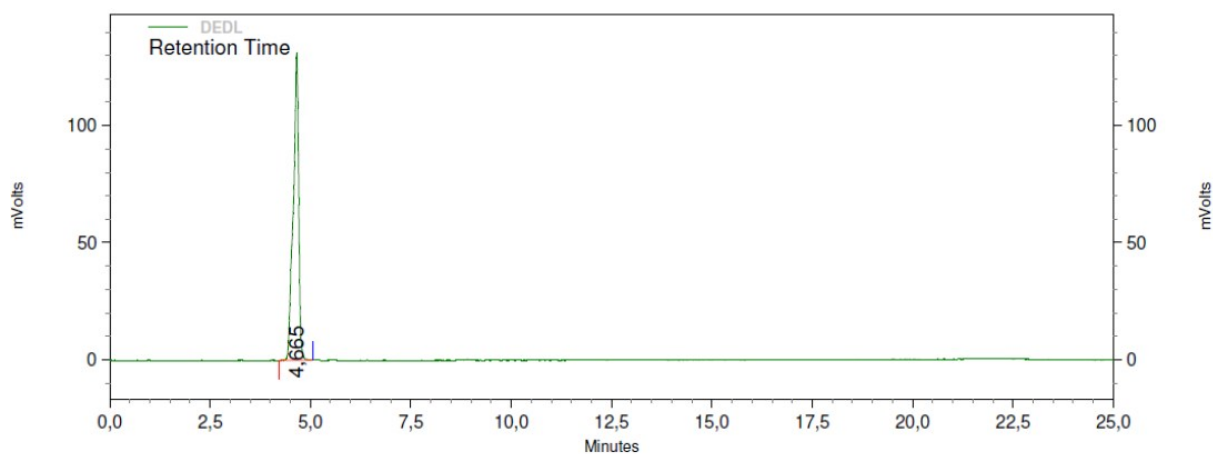
**Figure 2:** Mass spectrum of HHFA surfactant synthesized, ESI+, 50V



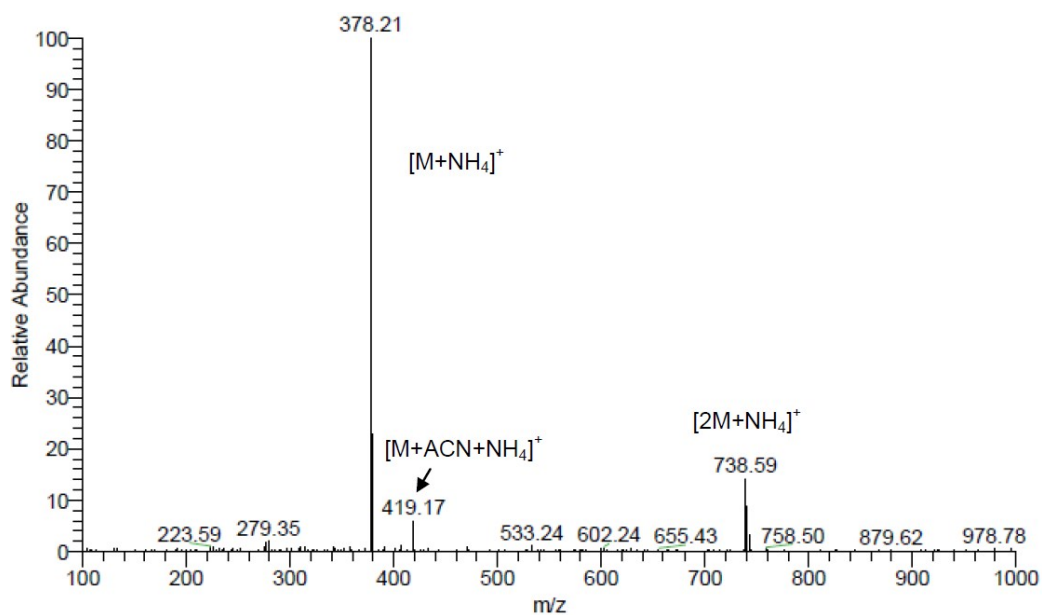
**Figure 3:**  $^1\text{H}$  NMR of HHFA surfactant synthesized,  $\text{CDCl}_3$ , 400 MHz, 3,5-dimethylanizole as internal standard



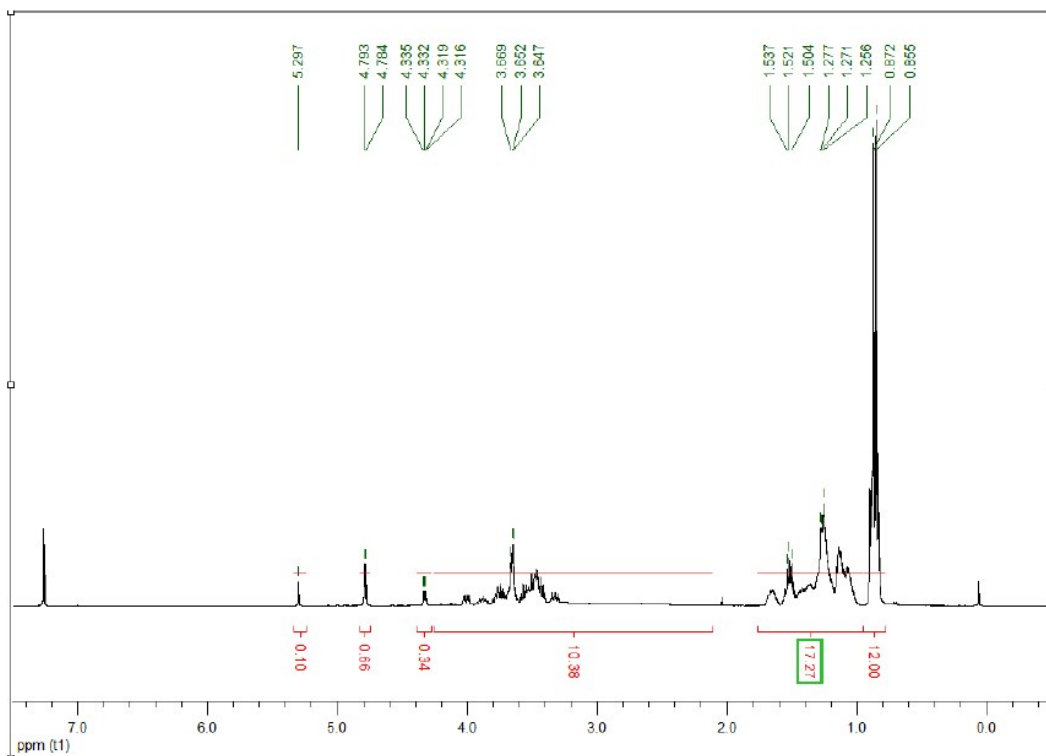
**Figure 4:**  $^{13}\text{C}$  NMR of HHFA surfactant synthesized,  $\text{CDCl}_3$ , 100 MHz



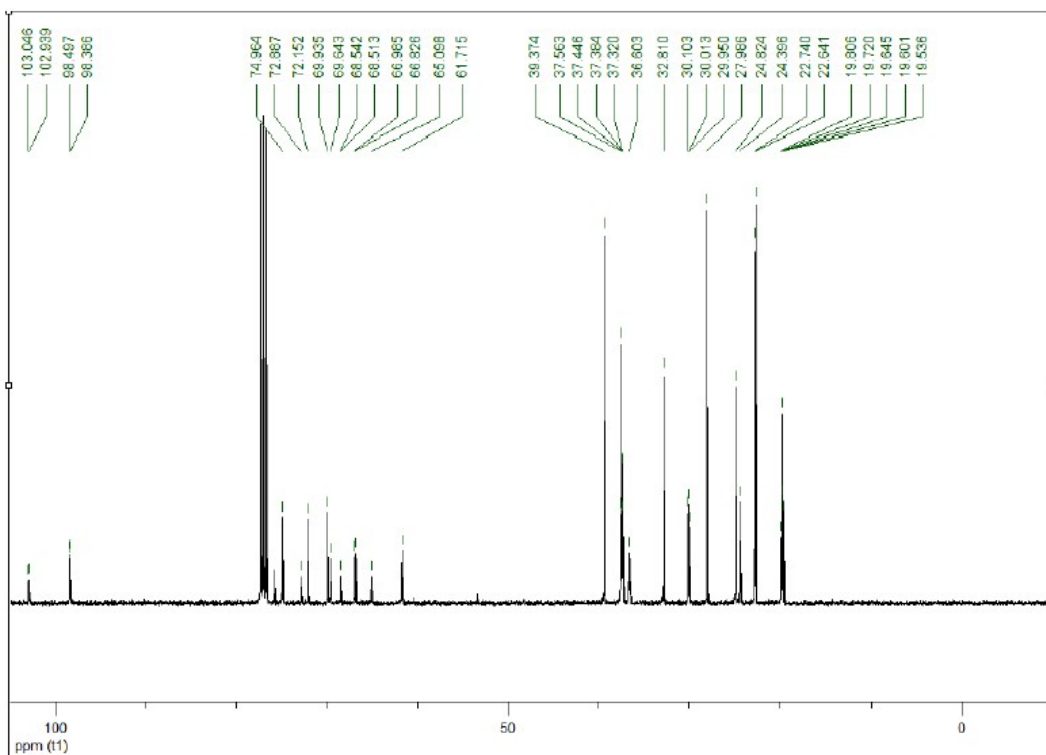
**Figure 5:** HPLC spectrum of HHFX surfactant synthesized with Luna C18 column (3 $\mu$ , 100\*4.6mm), water/acetonitrile (20/80), 30°C, 1mL/min



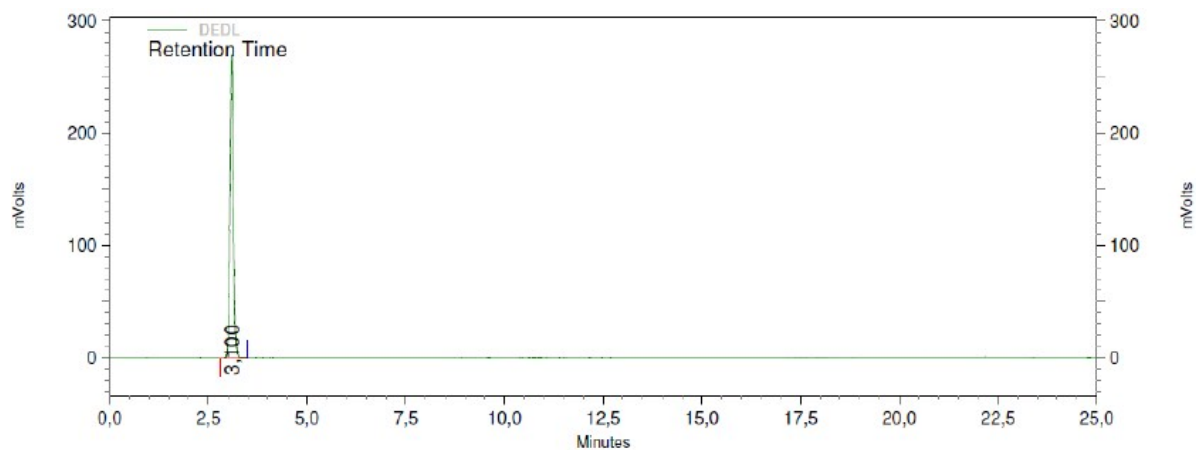
**Figure 6:** Mass spectrum of HHFX surfactant synthesized, ESI+, 50V



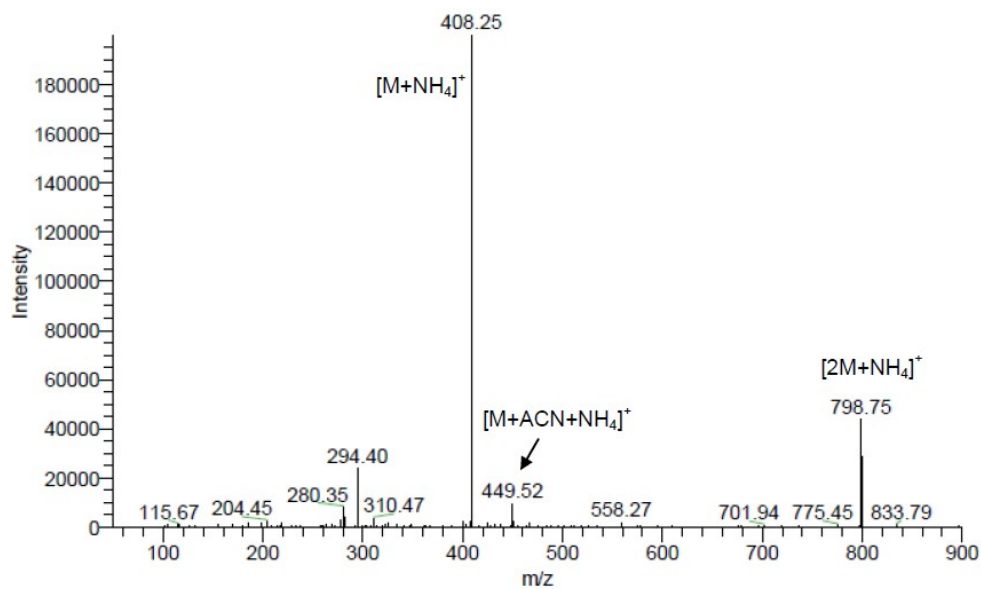
**Figure 7:**  $^1\text{H}$  NMR of HHFX surfactant synthesized,  $\text{CDCl}_3$ , 400 MHz, 3,5-dimethylanizole as internal standard



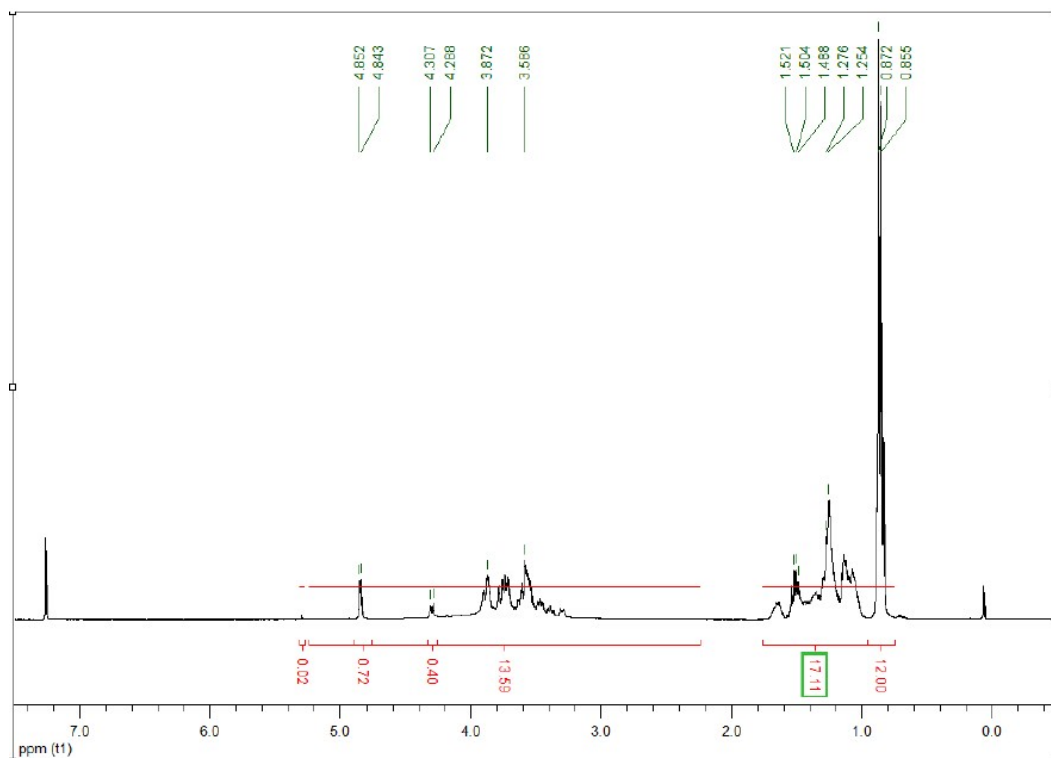
**Figure 8:**  $^{13}\text{C}$  NMR of HHFX surfactant synthesized,  $\text{CDCl}_3$ , 100 MHz



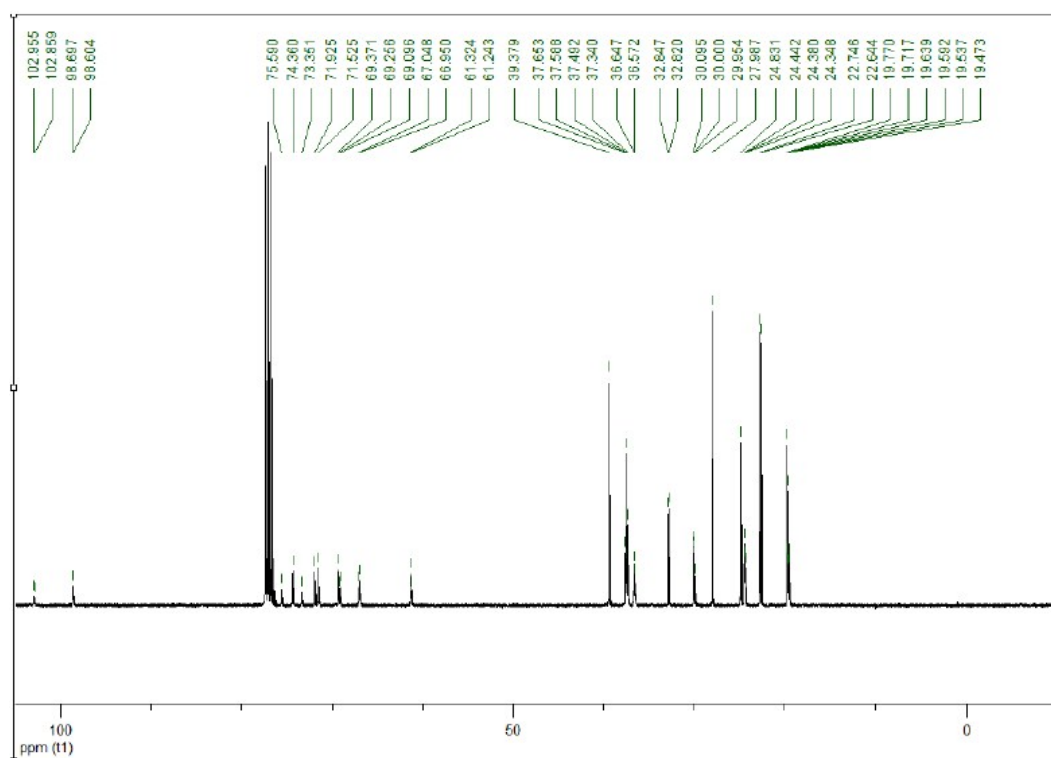
**Figure 9:** HPLC spectrum of HHFG surfactant synthesized with Luna C18 column (3 $\mu$ , 100\*4.6mm), water/acetonitrile (20/80), 30°C, 1mL/min



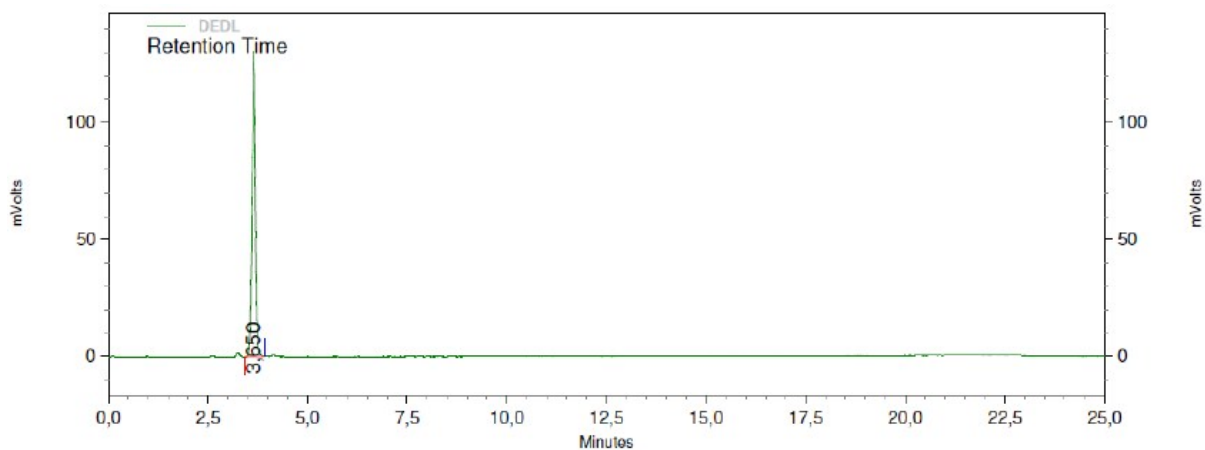
**Figure 10:** Mass spectrum of HHFG surfactant synthesized, ESI+, 50V



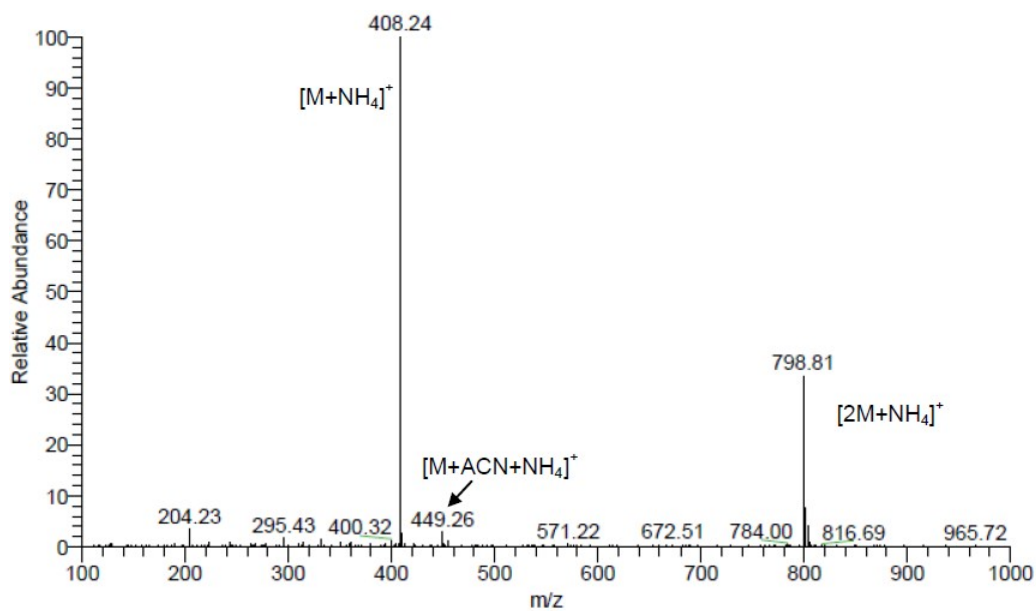
**Figure 11:**  $^1\text{H}$  NMR of HHFG surfactant synthesized,  $\text{CDCl}_3$ , 400 MHz, 3,5-dimethylanizole as internal standard



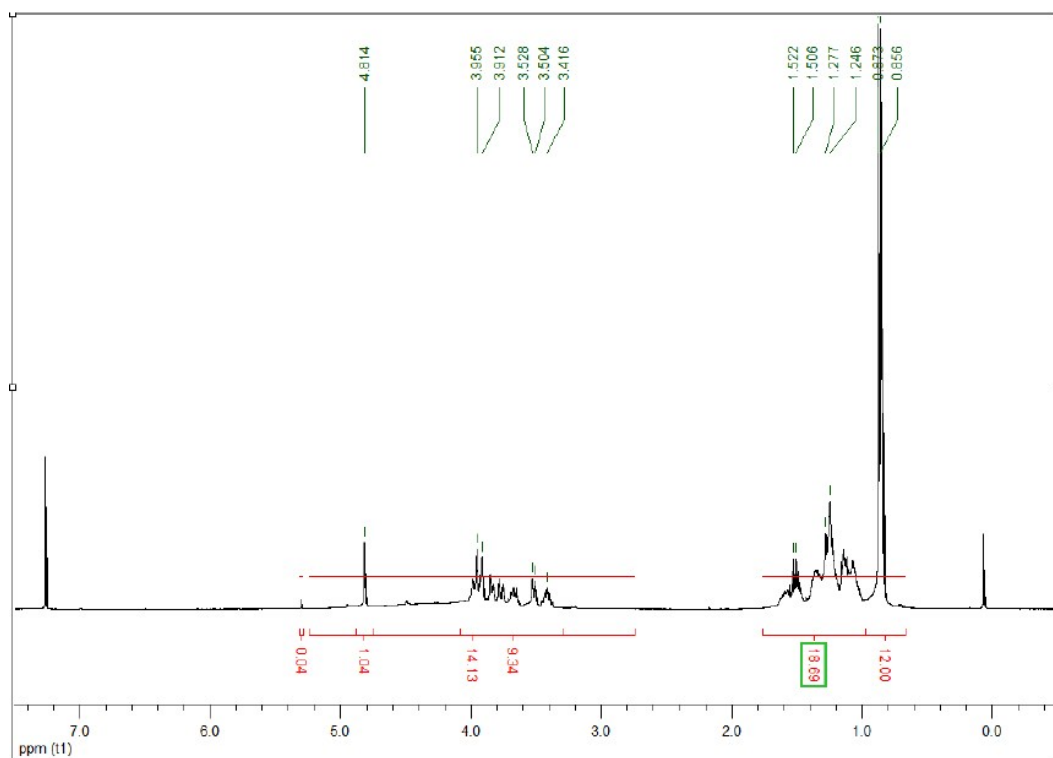
**Figure 12:**  $^{13}\text{C}$  NMR of HHFG surfactant synthesized,  $\text{CDCl}_3$ , 100 MHz



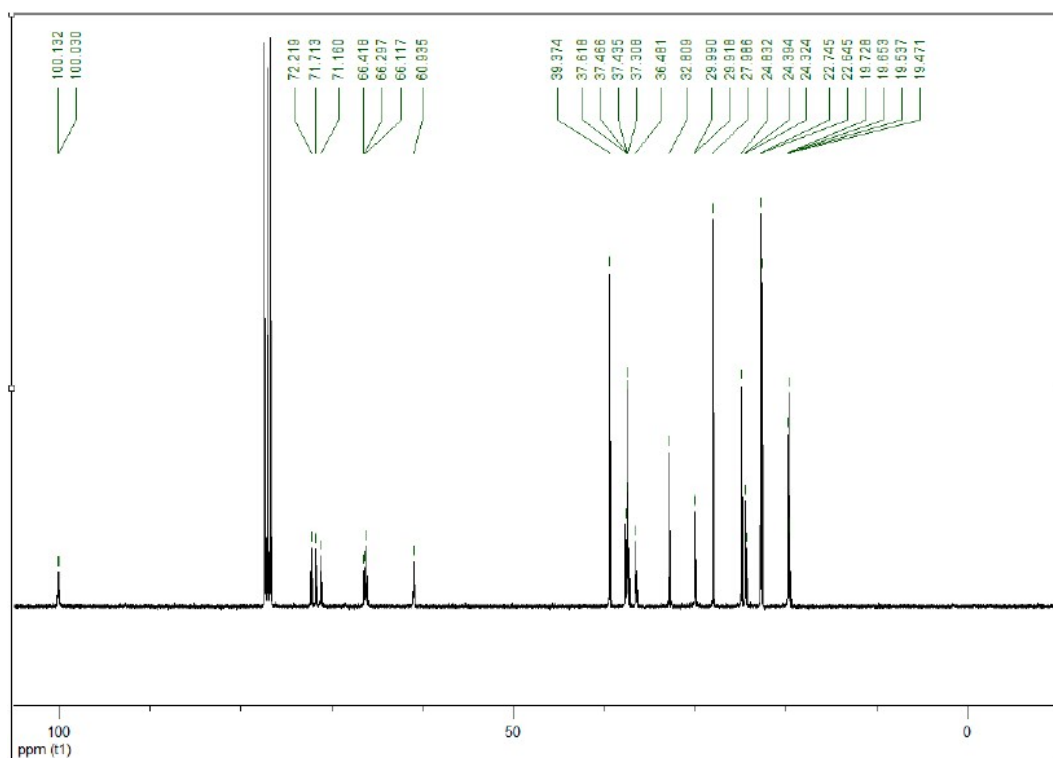
**Figure 13:** HPLC spectrum of HHFMan surfactant synthesized with Luna C18 column (3 $\mu$ , 100\*4.6mm), water/acetonitrile (20/80), 30°C, 1mL/min



**Figure 14:** Mass spectrum of HHFMan surfactant synthesized, ESI+, 50V

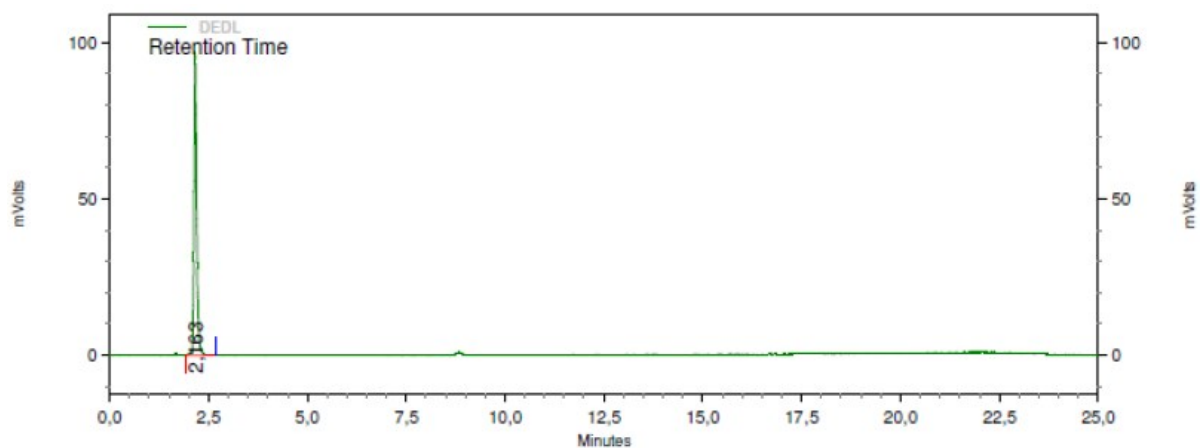


**Figure 15:**  $^1\text{H}$  NMR of HHFMan surfactant synthesized,  $\text{CDCl}_3$ , 400 MHz, 3,5-dimethylanizole as internal standard

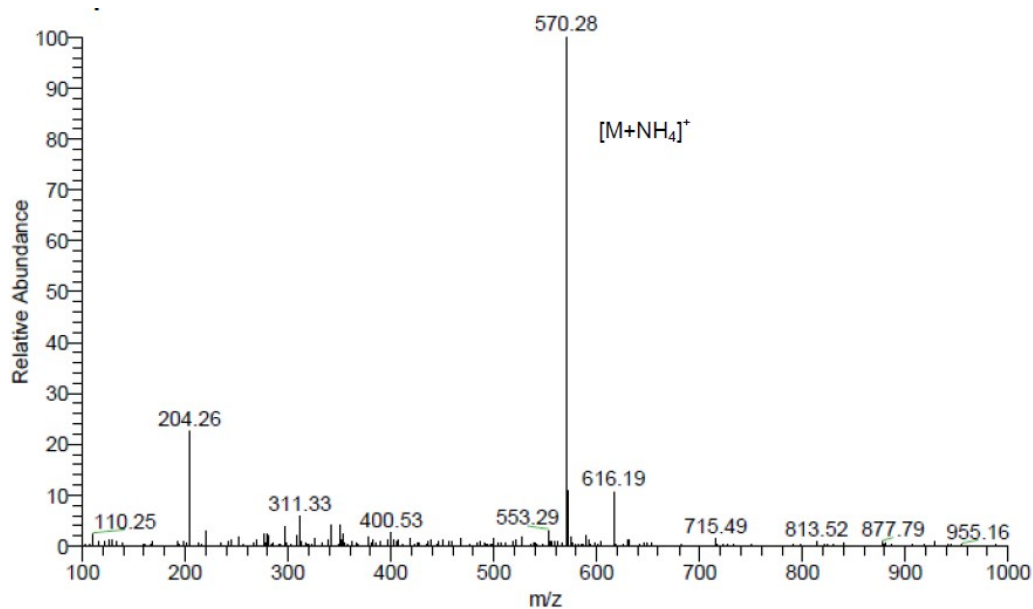


**Figure 16:**  $^{13}\text{C}$  NMR of HHFMan surfactant synthesized,  $\text{CDCl}_3$ , 100 MHz

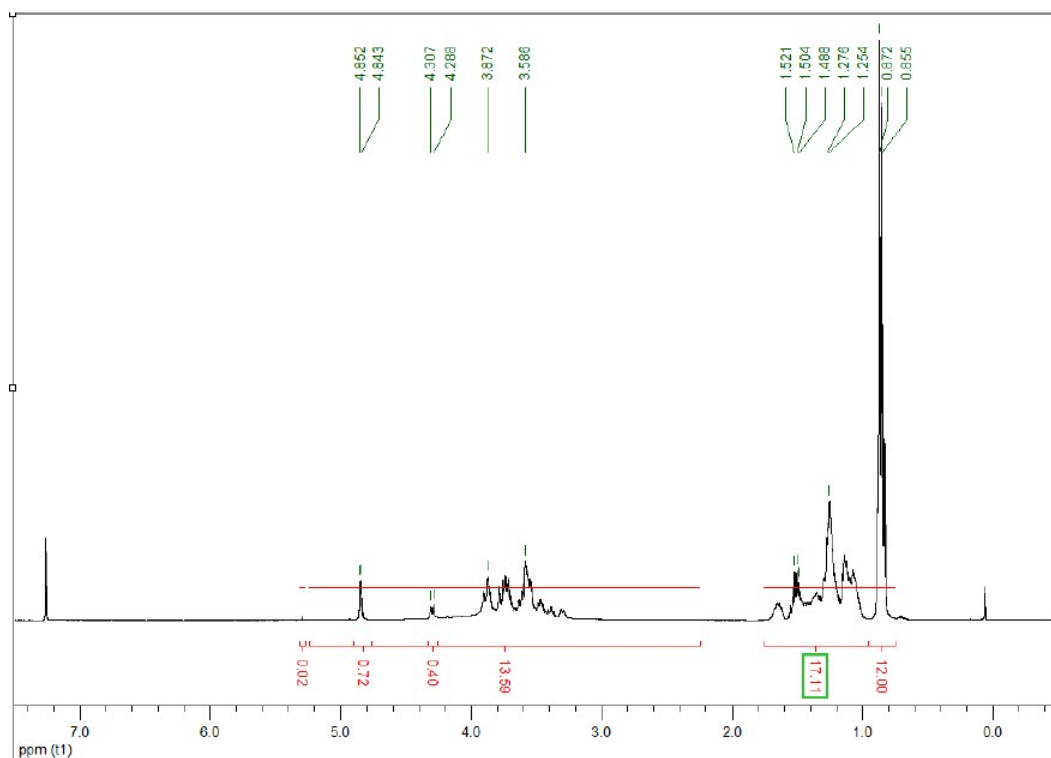




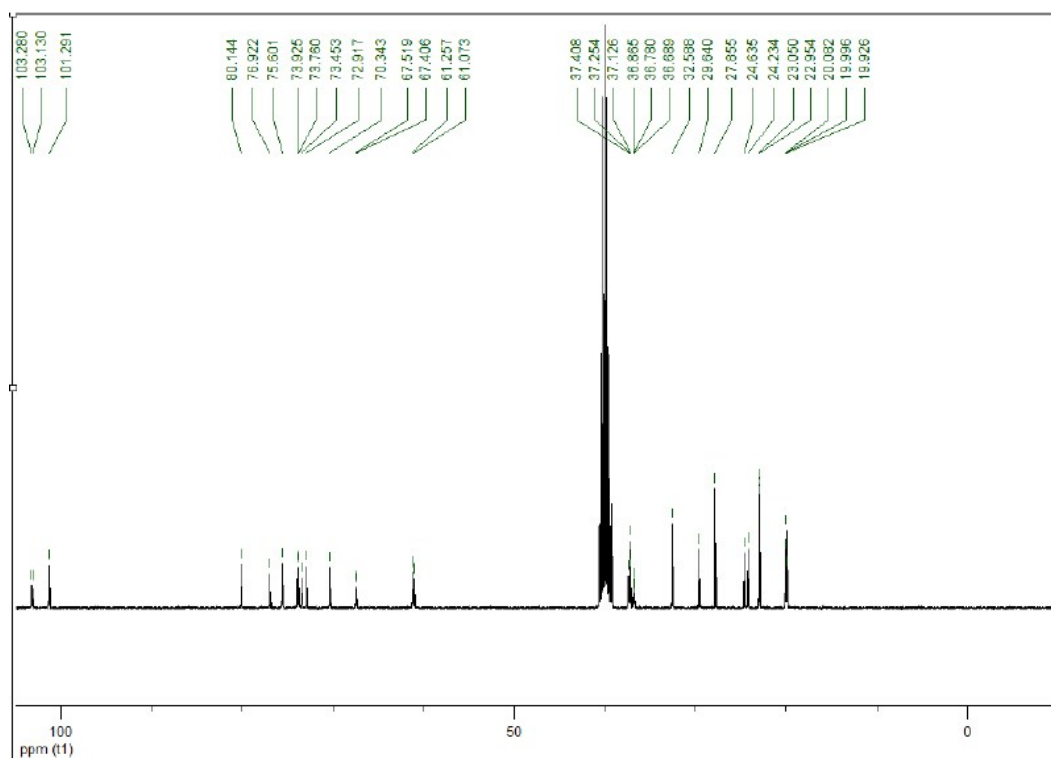
**Figure 17:** HPLC spectrum of HHFMalt surfactant synthesized with Luna C18 column (3 $\mu$ , 100\*4.6mm), water/acetonitrile (20/80), 30°C, 1mL/min



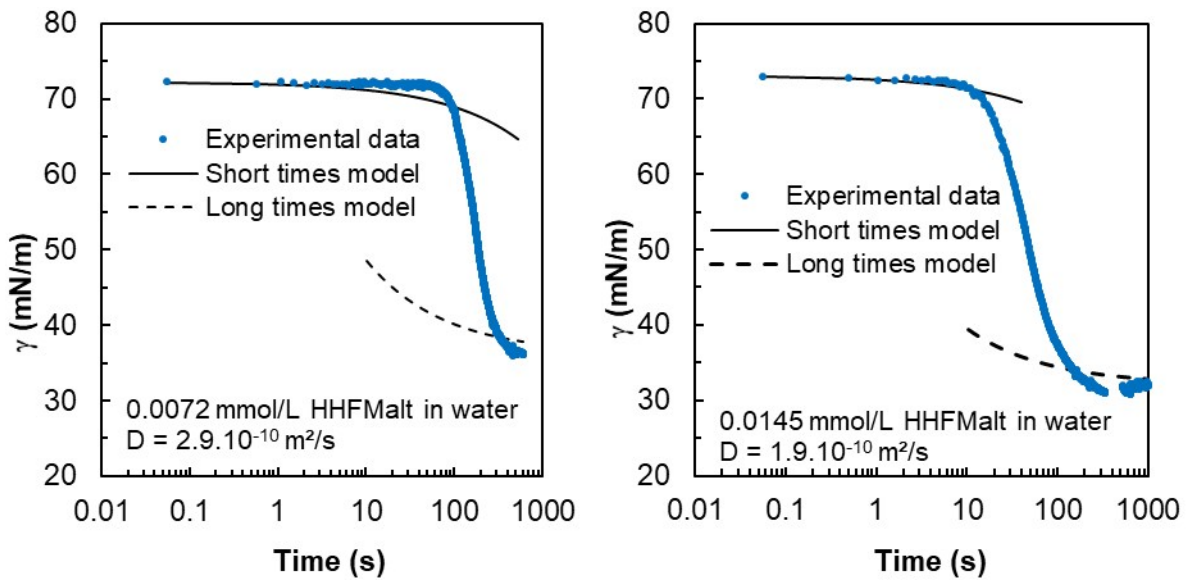
**Figure 18:** Mass spectrum of HHFMalt surfactant synthesized, ESI+, 50V



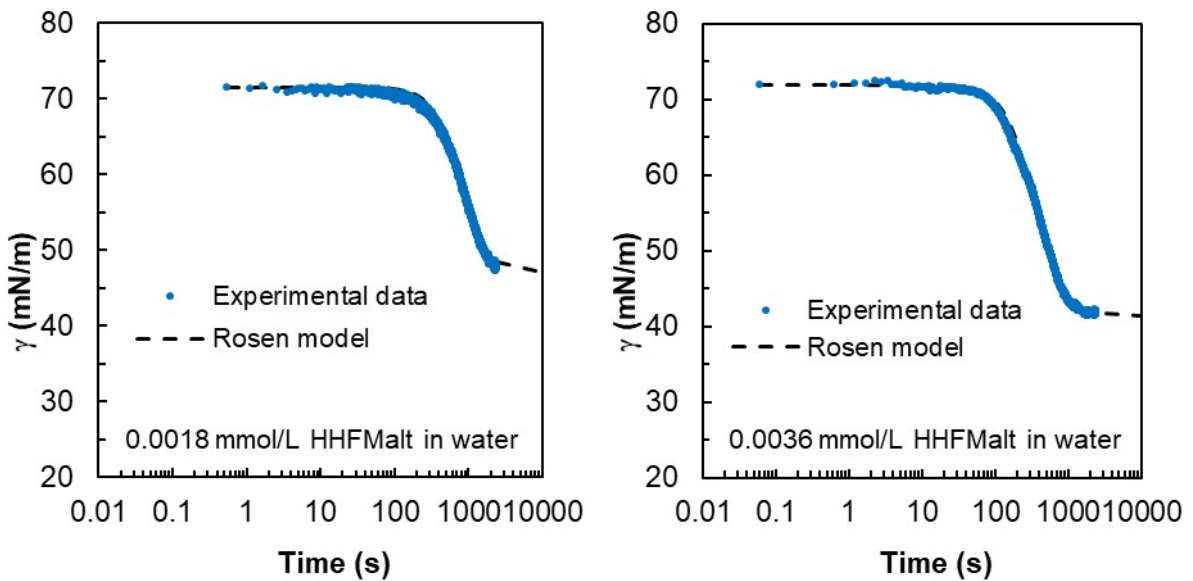
**Figure 19:**  $^1\text{H}$  NMR of HHFMalt surfactant synthesized,  $\text{CDCl}_3$ , 400 MHz, 3,5-dimethylanizole as internal standard



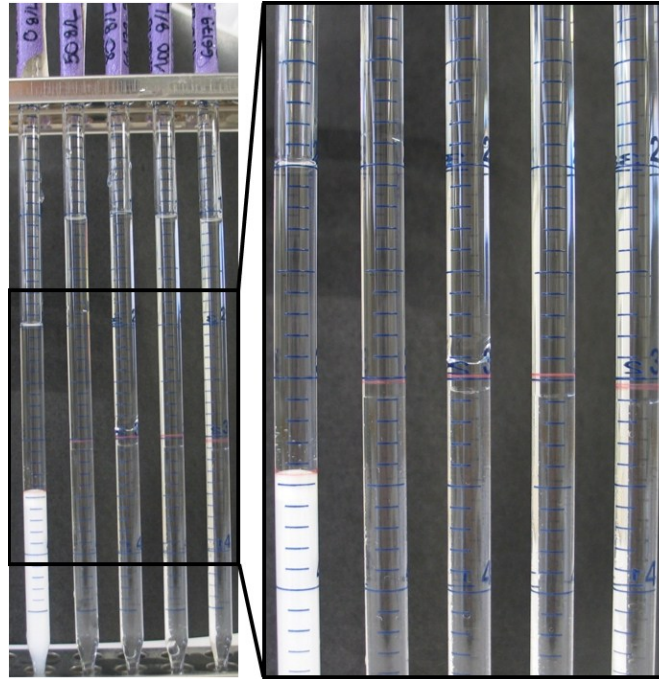
**Figure 20:**  $^{13}\text{C}$  NMR of HHFMalt surfactant synthesized,  $\text{CDCl}_3$ , 100 MHz



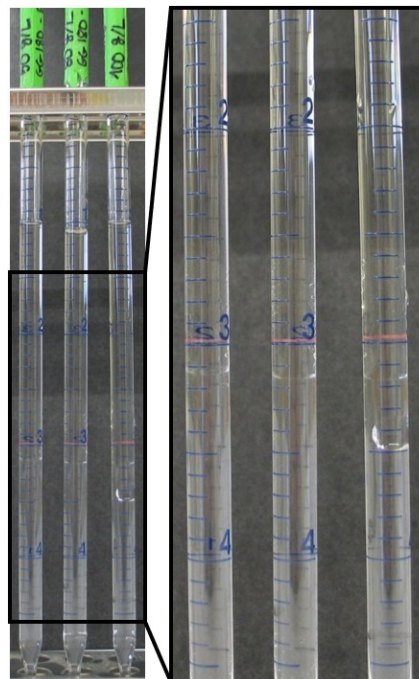
**Figure 21:** Approximation models versus experimental data for dynamic surface tension measurements in water with 0.0072 mmol/L (left) and 0.0145 mmol/L HHFMalt (right). Diffusion coefficient are obtained by minimizing the global error between experimental data with short and long times models



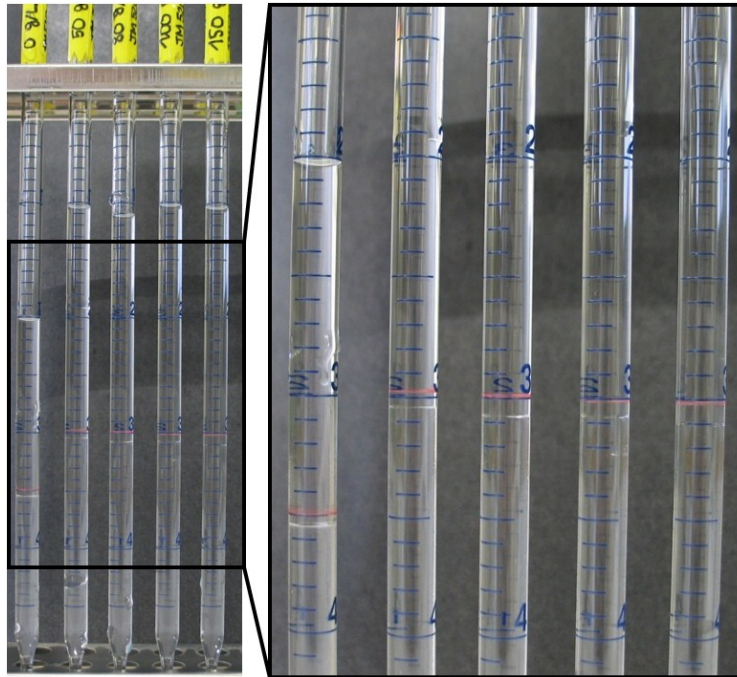
**Figure 22:** Experimental dynamic surface tension curves versus Rosen model for two different HHFMalt concentration below the CMC.  $t^*$  and  $n$  are obtained by minimizing the global error between experimental data with the Rosen model



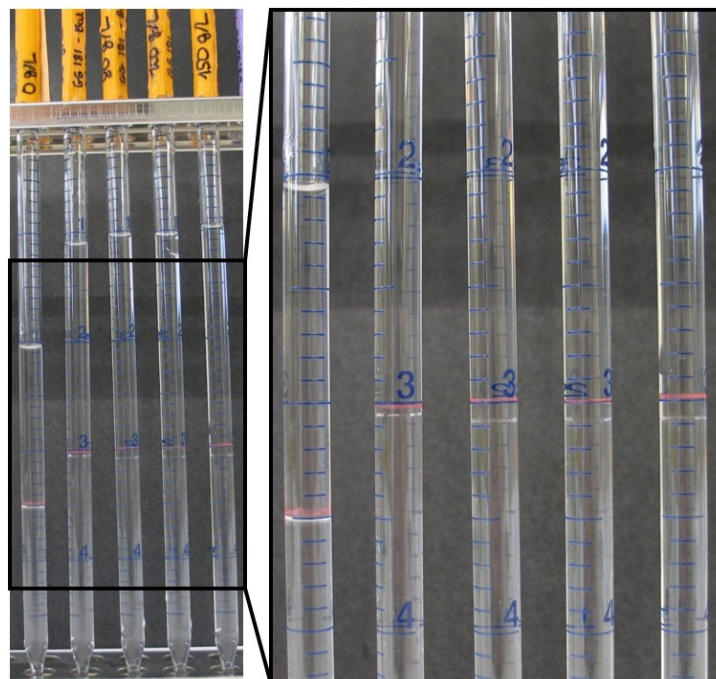
**Figure 23:** Salinity scan at 50°C with *n*-octane (WOR=1) using 1.8% wt. HHFA and 2.7% wt. 1-Butanol as co-surfactant ; NaCl concentration in aqueous phase: 0, 5, 8, 10 and 15% wt.



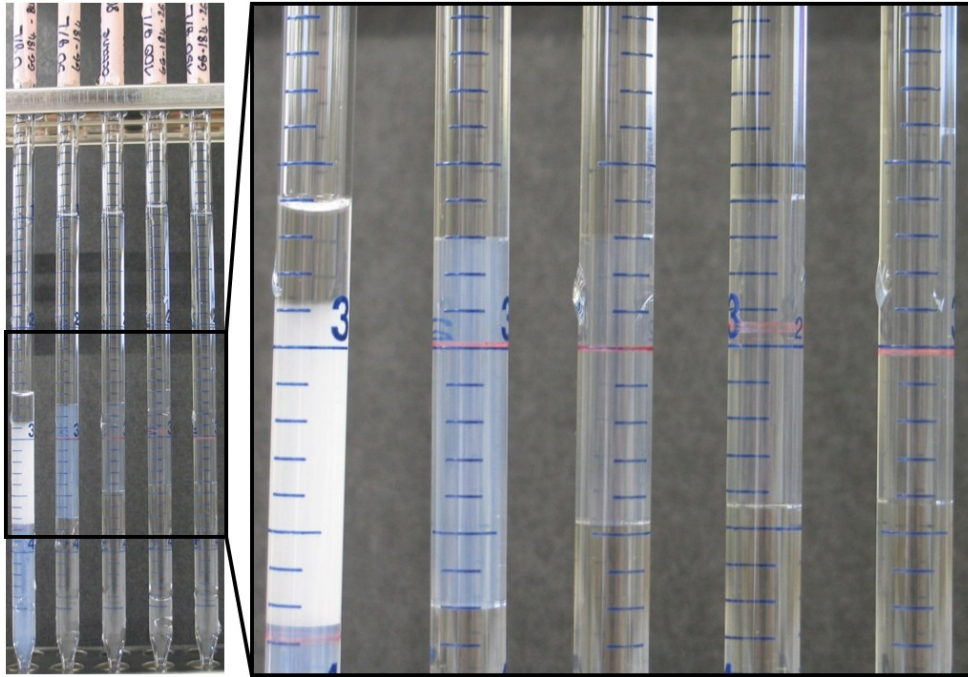
**Figure 24:** Salinity scan at 50°C with *n*-octane (WOR=1) using 1.8% wt. HHFX and 2.7% wt. 1-Butanol as co-surfactant ; NaCl concentration in aqueous phase: 5, 8 and 10% wt.



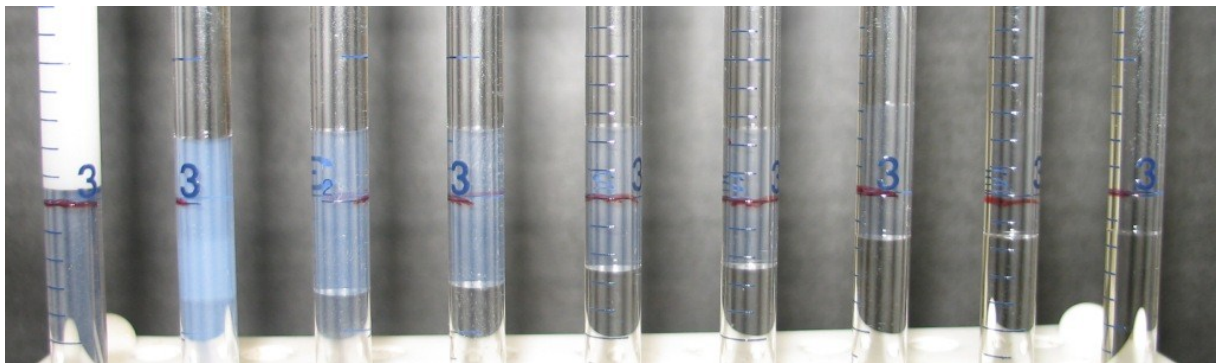
**Figure 25:** Salinity scan at 50°C with *n*-octane (WOR=1) using 1.8% wt. HHFG and 2.7% wt. 1-Butanol as co-surfactant ; NaCl concentration in aqueous phase: 0, 5, 8, 10 and 15% wt.



**Figure 26:** Salinity scan at 50°C with *n*-octane (WOR=1) using 1.8% wt. HHFG and 2.7% wt. 1-Butanol as co-surfactant ; NaCl concentration in aqueous phase: 0, 5, 8, 10 and 15% wt.



**Figure 27:** Salinity scan at 50°C with *n*-octane (WOR=1) using 1.8% wt. HHFMalt and 2.7% wt. 1-Butanol as co-surfactant ; NaCl concentration in aqueous phase: 0, 5, 8, 10 and 15% wt.



**Figure 28:** Salinity scan at 50°C with *n*-octane (WOR=1) using 3% wt. APG SL26 and 4.5% wt. 1-Butanol as co-surfactant ; NaCl concentration in aqueous phase: 0, 5, 6, 7, 8, 9, 10, 15 and 22.5% wt.