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FOAMABILITY AND FOAM STABILITY OF LICORICE ROOT EXTRACT: DYNAMIC SURFACE PROPERTIES EFFECTS

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Introduction

- The root extract of Licorice is rich in saponins and it can be considered a source of natural surfactant.
- The Licorice root has been used traditionally as a foaming agent in different industries.
- This research focuses on dynamic surface properties of LRE solutions and their effects on foam behavior.

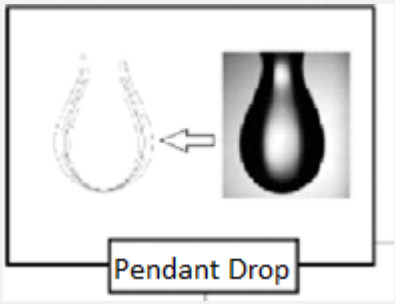
Licorice : *Glycyrrhiza glabra*
LRE : Licorice Root Extract

Material and Solution Preparation

- The root extract of Licorice was purchased from Herbalexsir (Mashhad, Iran).
- The extract was spray-dried using a spray dryer (Büchi B-191, Switzerland) at 150 ° C.
- For experiments, solutions were prepared at various concentrations (0.005–0.175 wt%).

Surface Tension and Surface Dilational Modulus

- The surface tension and surface viscoelasticity were measured using pendant drop tensiometry [Berry, 2015].
- The surface tension was measured over 6000 s, then, drop sinusoidal oscillations were started.
- For surface dilation parameters, the data are processed using a Fourier transformation.



J. D. Berry *et al*, Journal of colloid and interface science, 454:226-237, 2015.

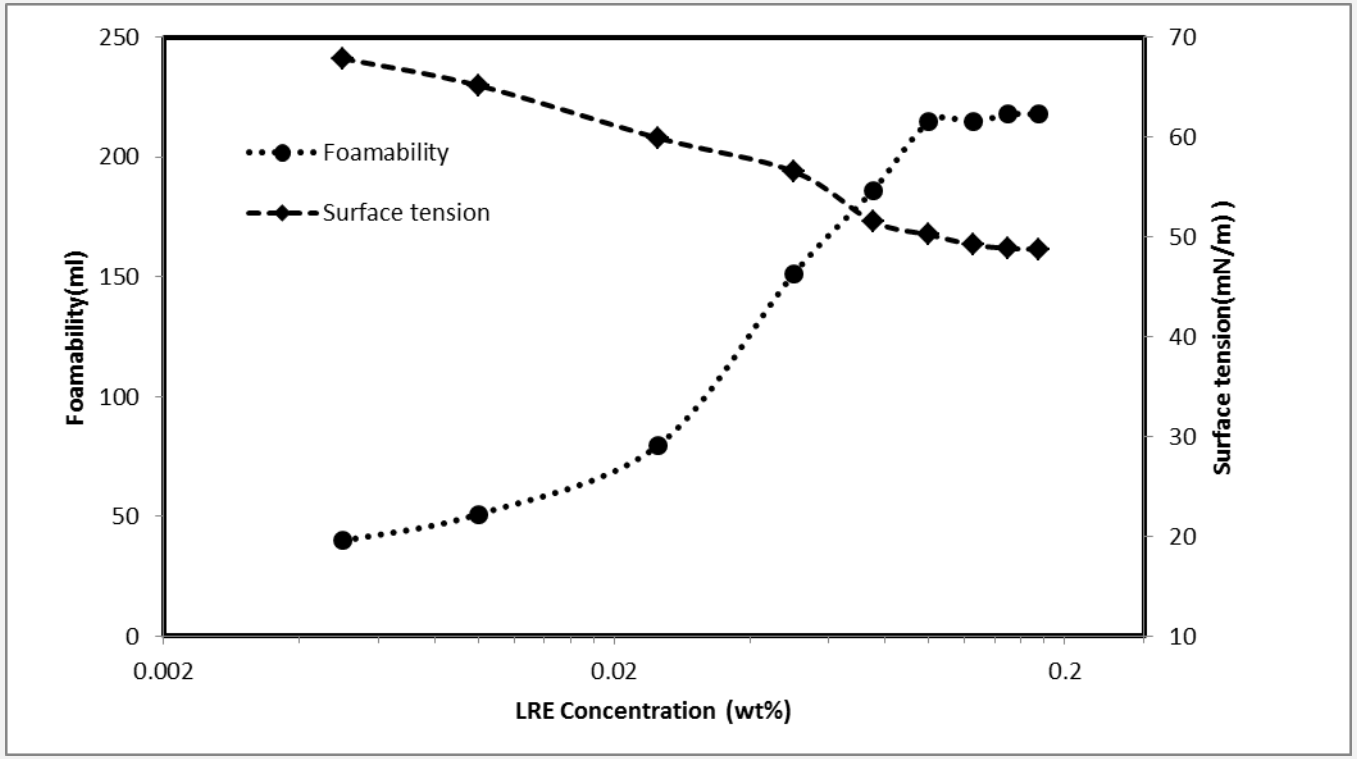
Foamability and Foam Stability

- The Bikerman type method was used for dynamic foamability examinations.
- For foamability, the air was injected through a porous disc at the bottom of a graduated column.
- The foam stability was determined by measuring height of foams as a function of time.

Results

❑ Faomability & Surface Tension

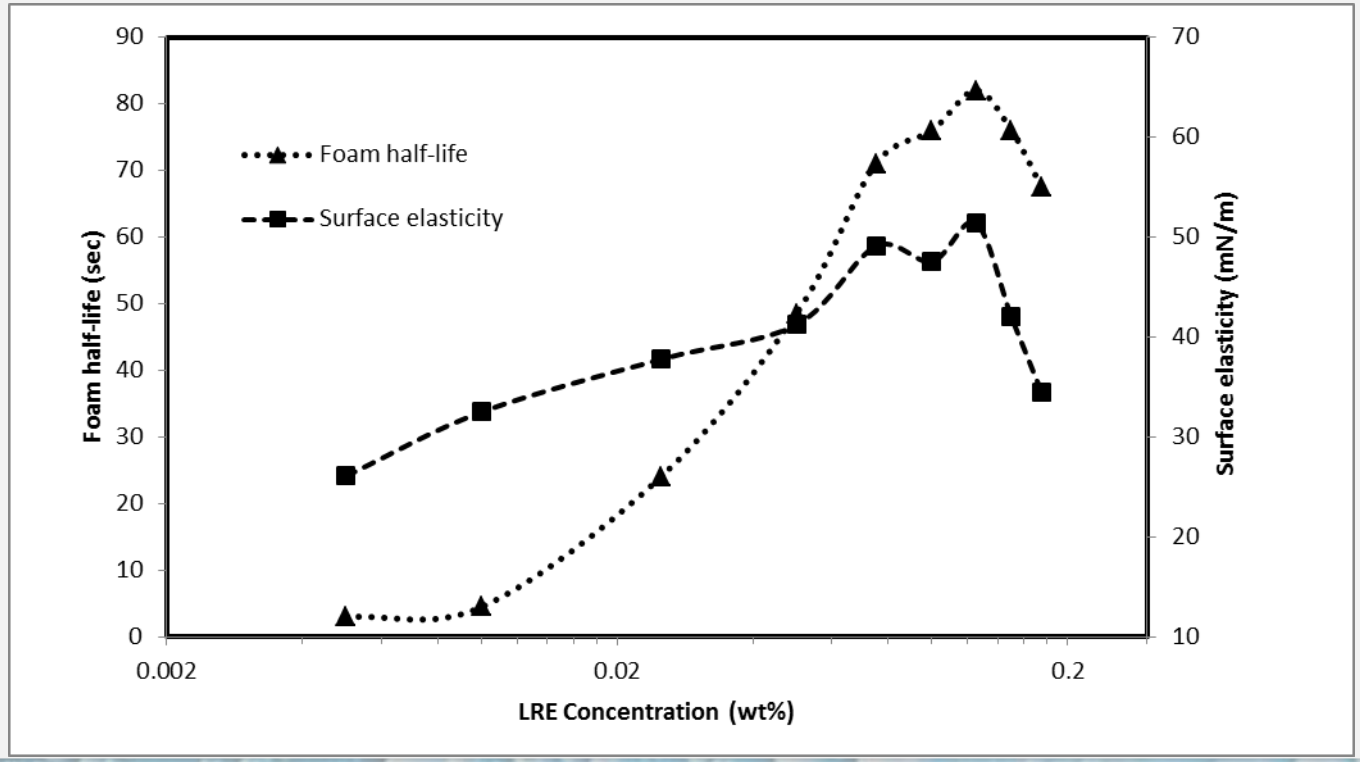
- Before the CMC, a sharp increase in foamability is observed.
- Above the CMC, negligible changes in foambilty can be seen.



Results

❑ Foam Half Life & Surface Dilational Elasticity

- High foam half-life values can be obtained for high surface elasticities.
- The significant role of the elastic part in foam stability is illustrated.



Conclusion

- The surface properties and the foam behavior of LRE solutions may considerably change due to variations in concentration.
- The results showed well a significant relationship between surface tension reduction and foamability.
- It was found a good correlation between changes in surface elasticity and the stability of LRE foams.