

Colloidal Gas Aphron Generated by a Cationic Surfactant as an Alternative Technique to Recovery Natural Colorants from Fermented Broth

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Abstract : There is worldwide interest in process development for colorants production from natural sources. Microorganisms provide an alternative source of natural colorants which can be produced by cultivation technology and extracted from fermented broth. The aim of the present work was to study the recovery of red colorants from fermented broth of *Penicillium purpurogenum* DPUA 1275 using the technique of Colloidal Gas Aphrons (CGA); CGA are surfactant-stabilized microbubbles generated by intense stirring of a surfactant solution. CGA were generated by the cationic, hexadecyl trimethyl ammonium bromide (CTAB) surfactant. Firstly, experiments were carried out at different surfactant/fermented broth volumetric ratios (VCGA/VFB, VRATIO) varying between 3 and 18 at pH 6.9. Secondly, the experiments were carried out at VRATIO of 6 and 12 in different pH, namely, 6.9, 8.0, 9.0 and 10.0. The first results of recovery showed that an increase in the VRATIO from 3 to 6 and 12 promoted an increase as recovery as partition coefficient. However, at VRATIO of 18 the lowest partition coefficient was obtained. The best results were achieved at VRATIO of 6 and 12, namely recovery, R_e , around 60% and partition coefficient, K , of 2.5 and 3.0 to 6 and 12 VRATIO, respectively. The second set of experiments showed that the pH 9.0 promoted the best results at VRATIO of 12 as follow: $R_e=70\%$, $K=5.39$, proteins and sugar selectivity (Se_{PROT} , 3.75 and Se_{SUGAR} , 7.20, respectively). These results indicate that with CTAB the recovery is mainly driven by electrostatic interactions. In conclusion, the results above show that CGA employing a cationic surfactant is a promissory technique and it can be used as the first step of purification to recovery red colorants from fermented broth.

Keywords : liquid-liquid extraction, colloidal gas aphrons, recovery, natural colorants

Conference Title : ICSPT 2015 : International Conference on Separation and Purification Technology

Conference Location : Barcelona, Spain

Conference Dates : February 26-27, 2015