Separation process of 5-aminolevulinic acid from *Rhodobacter spaeroides* for increasing value of agricultural product by ion exchange chromatography

P. Tripetch, G. Srzednicki, C. Borompichaichartkul

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Abstract

5-Aminolevulinic acid (ALA) is an amino acid which is a key precursor in the biosynthesis of all porphyrin compounds. ALA has wide applications in medicine and agriculture. The photosynthetic bacterium, *Rhodobacter sphaeroides*, is often used for biological ALA production. However, the ALA from the biological process is often contaminated with saccharides, protein, amino acids, organic acids, metal ions that are coexisting in the fermentation broth. One of methods that is used to separate ALA from crude solution is ion-exchange chromatography (IEC). Usually, strong cation resin is employed as the media base to ALA separate process. However, stability of ALA depend on pH (2-5) and temperature (<30°C). This study aimed at studying suitable conditions to decolorisation process and pH of eluent for performance of IEC separation. The results showed that decolorisation of the fermentation broth at an initial pH of 5 using activated carbon powder and shaking for 10 min could achieve >90% of decolorisation and increase efficiency of ALA separation. The two eluents, acetate buffer 1 M (pH 4.67) and acetate buffer 1 M (pH 3.8) can increase yield of ALA (>70%) and period of elution process is 100 min. The presence of ALA was confirmed by thin layer chromatography. Yellow spot was present when ALA has reacted with ninhydrin.