INTISARI

Emulsi merupakan suatu sistem dispersi dimana salah satu fase terdispersi dalam fase lainnya dengan adanya suatu zat pengemulsi. Umumnya, ada dua tipe emulsi, yaitu emulsi sederhana dan emulsi ganda. Masing-masing tipe emulsi memiliki kemampuan pelepasan zat aktif dan sifat-sifat fisik yang berbeda. Penelitian ini bertujuan untuk memformulasikan Ponceau 4R, zat warna larut air, ke dalam emulsi sederhana (A/M) dan emulsi ganda (A/M/A) serta membandingkan sifat-sifat fisik emulsi dan pelepasan Ponceau 4R dari kedua emulsi tersebut.

Pada penelitian ini dibuat emulsi A/M dengan konsentrasi Span 80 5%, 10%, 15%, dan 20% serta emulsi A/M/A dengan konsentrasi CMC Na 1%, 2%, dan 3%. Dilakukan evaluasi sifat-sifat fisik emulsi yaitu determinasi tipe emulsi, pemisahan fase, viskositas, dan ukuran droplet emulsi, serta evaluasi pelepasan Ponceau 4R *in vitro*. Data tipe emulsi dan ukuran droplet dianalisis secara kualitatif, sedangkan data lainnya dianalisis menggunakan *one way* ANOVA dan *Independent-Samples T Test. One way* ANOVA digunakan untuk analisis data antar konsentrasi emulgator pada masing-masing tipe emulsi. *Independent-Samples T Test* digunakan untuk analisis data antar tipe emulsi.

Hasil uji determinasi tipe emulsi menunjukkan tipe emulsi yang dibuat adalah A/M dan A/M/A. Droplet emulsi A/M/A terlihat lebih besar dibandingkan droplet emulsi A/M. Pemisahan fase dan viskositas emulsi A/M dan A/M/A berbeda signifikan ($p<0,05$). Pada emulsi A/M (konsentrasi span 80 15%), rasio pemisahan yang diperoleh adalah 0,821 dan viskositas sebesar 494 mPas. Pada emulsi A/M/A konsentrasi CMC Na 1%, 2%, dan 3%, rasio pemisahannya berturut-turut adalah 0,928; 0,945; 0,976 dan viskositasnya sebesar 2565 mPas, 2610 mPas, 3059 mPas. Hasil uji difusi menunjukkan pelepasan Ponceau 4R dari emulsi A/M dan A/M/A tidak berbeda signifikan ($p>0,05$), dimana %bobot Ponceau 4R terdifusi dari emulsi A/M adalah 0,034% dan dari emulsi A/M/A konsentrasi CMC Na 1%, 2%, dan 3% berturut-turut adalah 0,055%, 0,058%, dan 0,095%.

Kata kunci: emulsi, pelepasan, *in vitro*, sifat fisik

ABSTRACT

Emulsion is a dispersion system in which one phase is dispersed in another phase in the presence of an emulsifier. Generally, there are two types of emulsions, namely simple emulsions and multiple emulsions. Each type of emulsion has different ability to release active substances and different physical properties. This study aimed to formulate Ponceau 4R, a water soluble dye, into simple emulsions (W/O) and multiple emulsions (W/O/W) and compare their physical properties and the release of Ponceau 4R from both types of emulsions.

In this research, W/O emulsion was prepared using Span 80 5%, 10%, 15%, and 20% and W/O/W emulsion was prepared using CMC sodium 1%, 2%, and 3%. Emulsion type determination, phase separation, viscosity, and droplet size were evaluated as well as the release of Ponceau 4R *in vitro*. Data of emulsion type and droplet size were analyzed qualitatively, while other data were analyzed using one way ANOVA and Independent-Samples T Test. One way ANOVA is used to analyze data among emulsifier concentrations in each emulsion type. Independent-Samples T Test is used to analyze data between types of emulsions.

The emulsion type determination test shows that the emulsion type is W/O and W/O/W. Droplet size of W/O emulsion is bigger than W/O/W emulsion. Phase separation and viscosity between W/O and W/O/W emulsions were significantly different ($p < 0,05$). In the W/O emulsion (concentration span 80 15%), the separation ratio obtained was 0,821 and the viscosity was 494 mPas. In the W/O/W emulsion with concentration of CMC Na 1%, 2%, and 3%, the separation ratio obtained were 0,928; 0,945; 0,976 and the viscosity were 2565 mPas, 2610 mPas, 3059 mPas. The diffusion test showed that the release of Ponceau 4R from W/O and W/O/W emulsions did not differ significantly ($p > 0,05$), where the percentage of Ponceau 4R diffused from the W/O emulsion was 0,034% and from the W/O/W emulsion with concentration of CMC Na 1%, 2%, and 3% were 0,055%, 0,058%, and 0,095%, respectively.

Keywords: emulsion, release, *in vitro*, physical properties