INCLUSION COMPLEX OF USNIC ACID:β-CYCLODEXTRIN. PREPARATION, CHARACTERIZATION AND NANOENCAPSULATION INTO LIPOSOMES

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In this study the β-cyclodextrin was used to improve usnic acid (UA) solubility. The inclusion complex (UA:βCD) was incorporated into liposomes. UA:βCD was prepared using *freeze-dried* technique and characterized through thermal analysis, infrared, X-ray and H^1NMR spectroscopy. Phase-solubility assays and dissolution test were also performed. Liposomes were prepared using hydration of a dry lipid film method with subsequent sonication. Liposomes containing UA:βCD were evaluated using standard stability tests. Phase-solubility diagram of UA:βCD shows an A_L curve with an apparent stability constant $K_{1:1}$=745.32 M^{-1}. The UA amount dissolved from UA:βCD was 50% higher than that from free UA. UA:βCD presented NMR and IR spectral modifications in comparison with UA or βCD spectra. DSC analysis showed the disappearance of UA fusion peak. A change of UA from its crystalline to amorphous form was observed in X-ray, suggesting the formation of drug inclusion complexes. No difference between the antimicrobial activity of free UA and UA:βCD was observed, supporting that the complexation has no interfere on drug activity. Formulations of liposomes containing UA:βCD were stable for 4 months and the drug encapsulation efficiency was 99.5%.

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