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Abstract

The objective of this study, the encapsulation of prickly pear seed oil with polyhydroxy butyrate-co-valerate (PHBV) using the solvent evaporation technique. UV-Vis and FTIR techniques were used to ascertain the profile of PPSO loaded PHBV microcapsules. TGA and SEM studies were done to find out the thermal stability and morphological characteristics of the microcapsules, respectively.

Introduction

Generally, encapsulation is defined as a process to entrap a substance (active agent) in another substance (wall material). The encapsulated substance, except for the active agent, can be called the core, the filler, the active phase, internal or the payload. The encapsulating substance is often called the coating, membrane, envelope membrane, shell, capsule, carrier material, outer phase or matrix.

Materials and methods

- **Materials:** Polyhydroxy(butyrate-co-valerate) (PHBV), and Prickly pear seed oil (PPSO)
- **Preparation of capsules:**

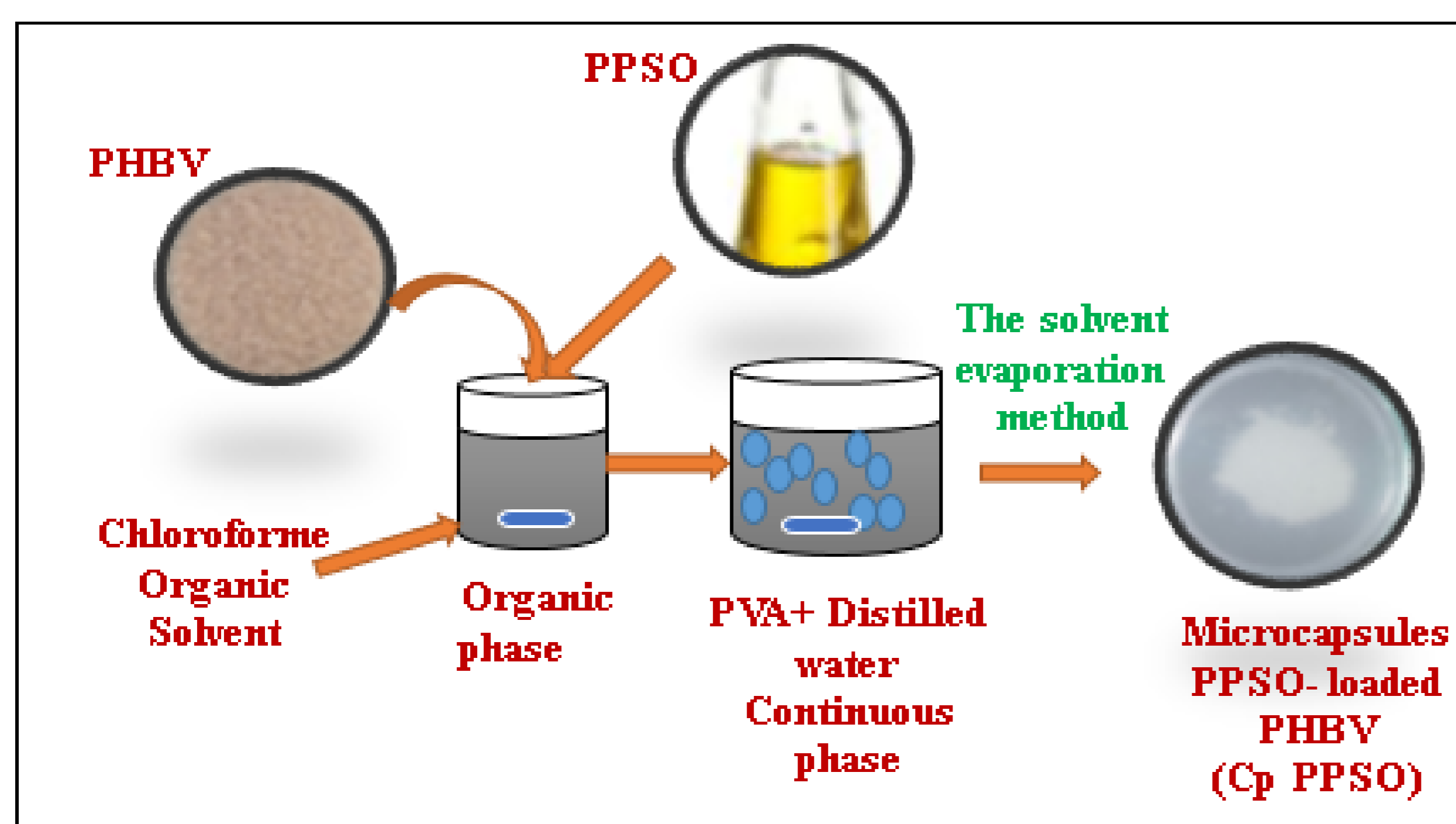


Figure 1: Preparation of PPSO loaded PHBV capsules

Results and Discussions

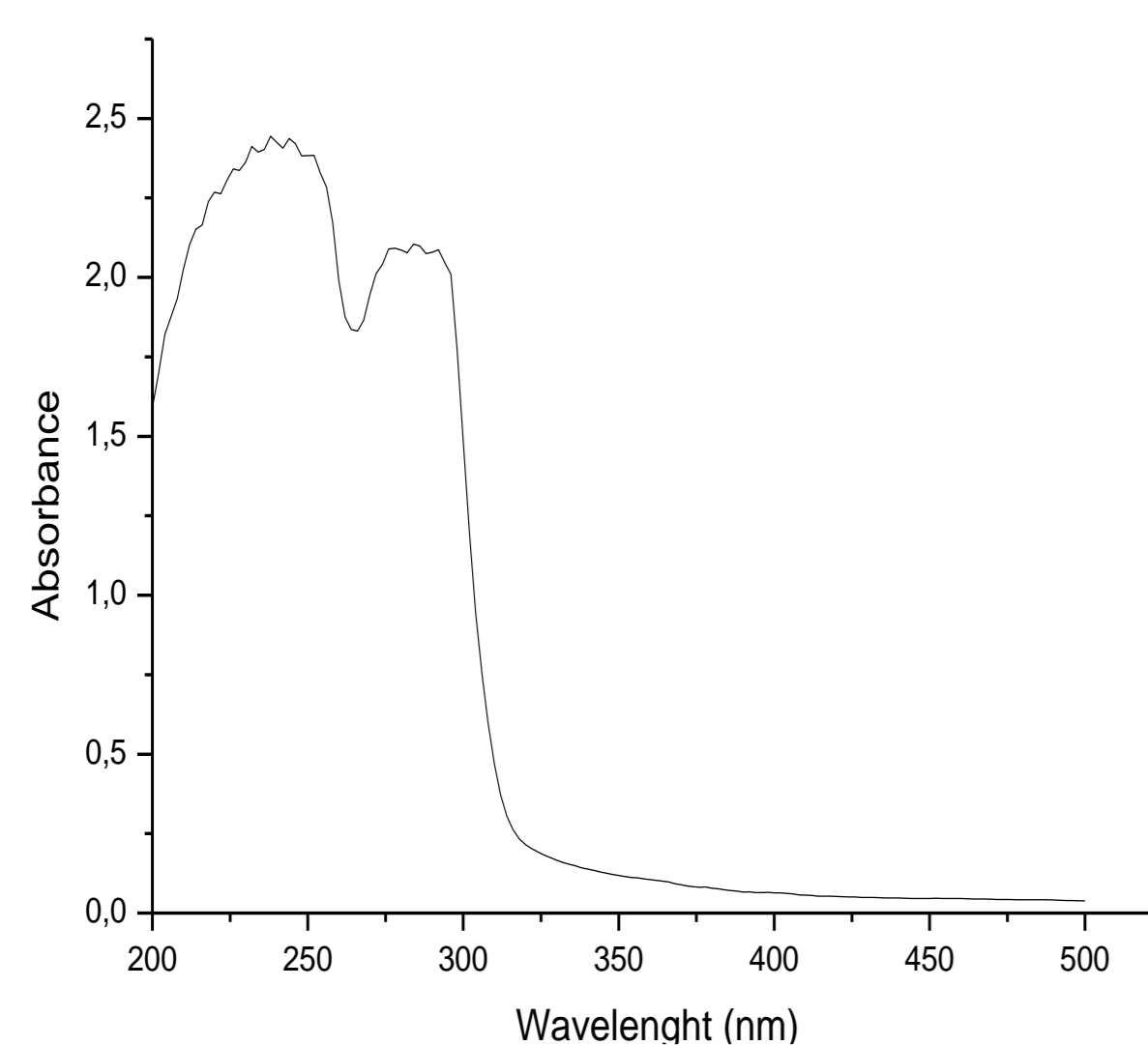


Figure 2: The absorbance of PPSO in chloroform from 200nm to 500nm

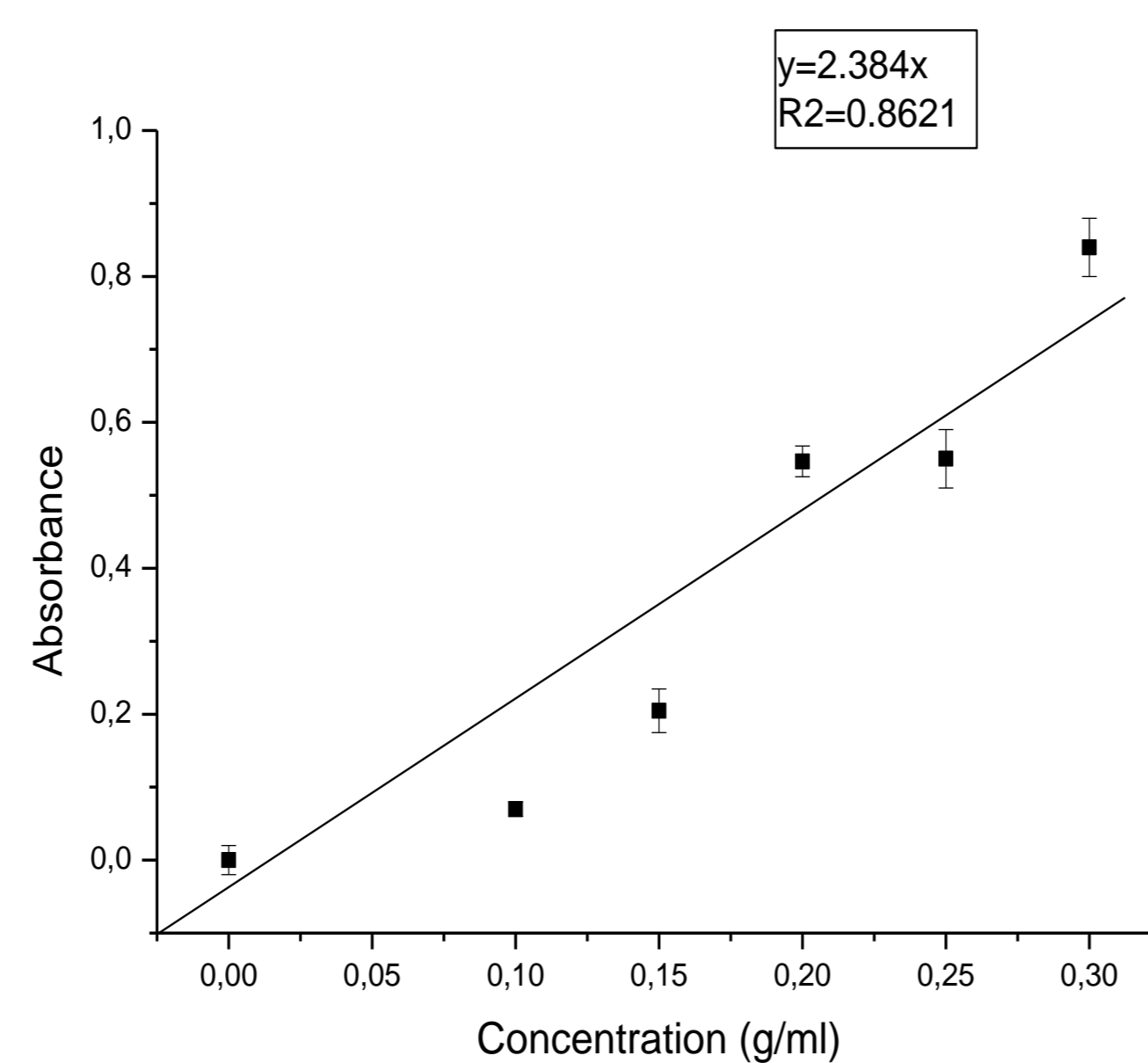


Figure 3: Calibration curve of Prickly pear seed oil PPSO at $\lambda=244\text{nm}$

Table 01: Influence of PPSO concentration on the encapsulation efficiency

Concentration (g/ml)	0.075	0.15	0.2	0.24
EE %	16 ± 0.8	20 ± 1	23.9 ± 1.195	25 ± 1.25

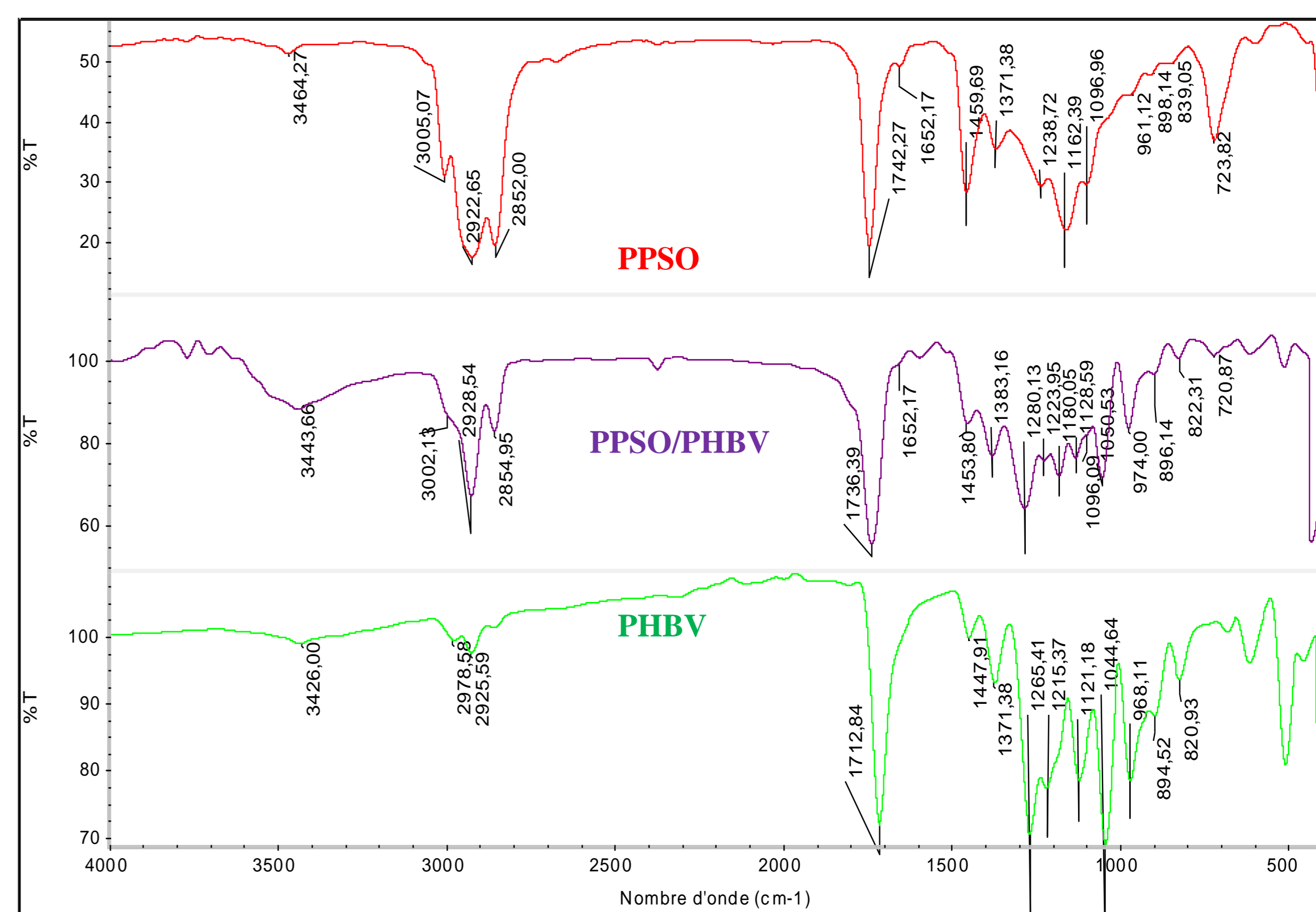
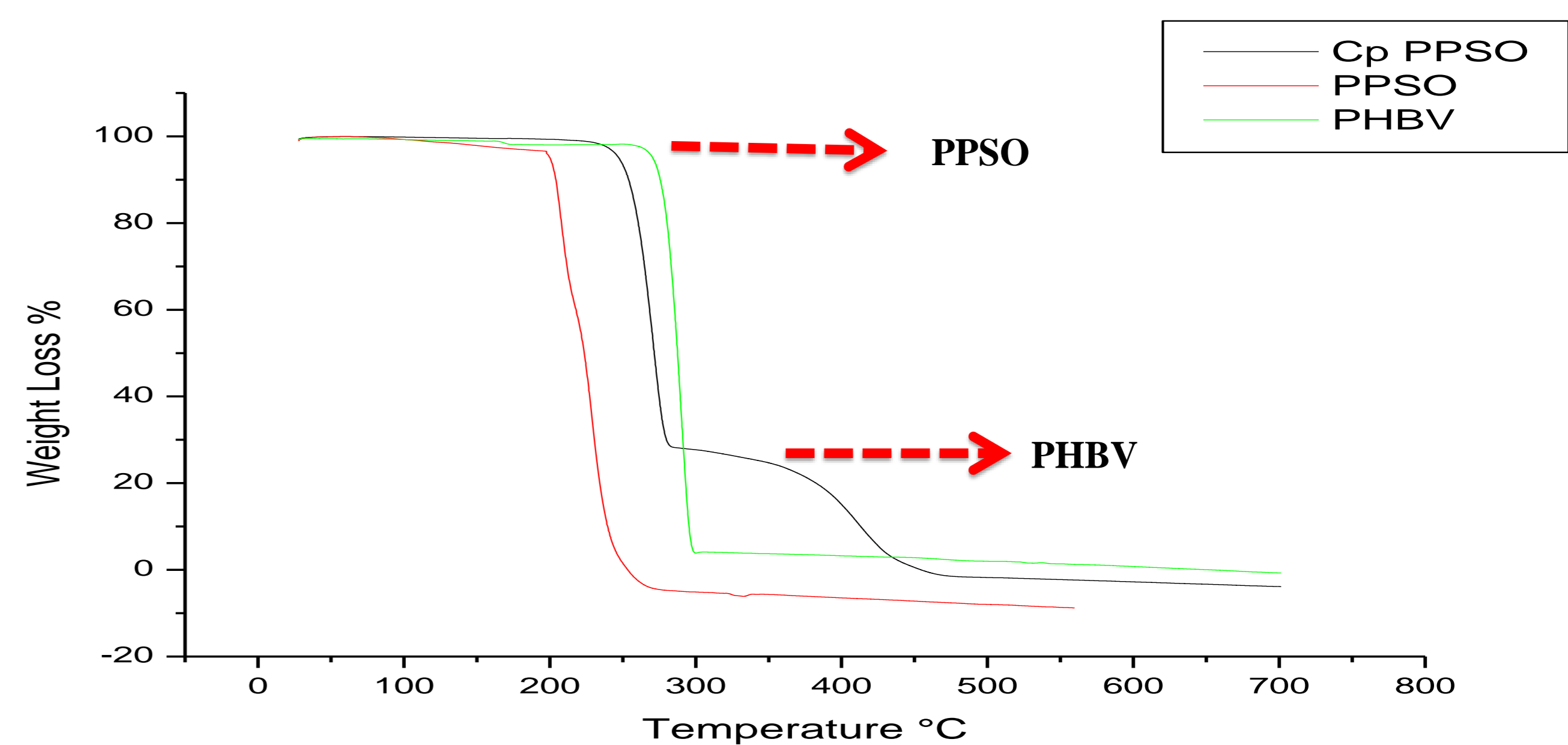


Figure 4: Infrared spectra of A-PHBV, B - microparticles PPSO-loaded PHBV (EE=25%) C-PPSO



Conclusions

- Encapsulation efficiency equal to 25% was obtained with 0.24g/ml of PPSO concentration.
- Thermogravimetric analysis showed the presence of two degradation steps. The first degradation step (239 °C - 280 °C) corresponds to the decomposition of PPSO, whereas, the second degradation step (300 °C - 458 °C) is related to that of PHBV and implies to the presence of PPSO in the microcapsules.