

Gastro-resistant microparticles produced by spray-drying as controlled release systems for liposoluble vitamins

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Supplementary Information

Table S1. Summary table of the formulation compositions of all the batches subjected to the spray drying process.

Batches	Formulations' composition
A1	2 g Arabic gum
	2.5 g Mannitol
	0.25 g Soy lecithin
	0.5 g Retinyl palmitate (in 5 ml of ethanol)
	0.6 g Eudraguard Biotic (2 ml 30% v/w)
	45 ml Distilled water
B1	2 g Arabic gum
	2.5 g Mannitol
	0.25 g Soy lecithin
	0.5 g β -carotene(in 5 ml of ethanol)
	0.6 g Eudraguard Biotic (2 ml 30% v/w)
	45 ml Distilled water
C1	2 g Arabic gum
	2.5 g Mannitol
	0.25 g Soy lecithin
	0.5 g Retinyl acetate (in 5 ml of ethanol)
	0.6 g Eudraguard Biotic (2 ml 30% v/w)
	45 ml Distilled water

D1	2 g Arabic gum 2.5 g Mannitol 0.25 g Soy lecithin 0.1 g Cholecalciferol (in 5 ml of ethanol) 0.6 g Eudraguard Biotic (2 ml 30% v/w) 45 ml Distilled water
E1	2 g Arabic gum 2.5 g Mannitol 0.25 g Soy lecithin 0.25 g α -tocopherol (in 5 ml of ethanol) 0.6 g Eudraguard Biotic (2 ml 30% v/w) 45 ml Distilled water
A2	2 g Arabic gum 2.5 g Mannitol 0.25 g Soy lecithin 0.5 g Retinyl palmitate (in 5 ml of ethanol) 0.25 g CAP 45 ml Distilled water
B2	2 g Arabic gum 2.5 g Mannitol 0.25 g Soy lecithin 0.5 g β -carotene (in 5 ml of ethanol) 0.25 g CAP 45 ml Distilled water
C2	2 g Arabic gum 2.5 g Mannitol 0.25 g Soy lecithin 0.5 g Retinyl acetate (in 5 ml of ethanol) 0.25 g CAP 45 ml Distilled water
D2	2 g Arabic gum 2.5 g Mannitol 0.25 g Soy lecithin 0.1 g Cholecalciferol (in 5 ml of ethanol) 0.25 g CAP 45 ml Distilled water
E2	2 g Arabic gum 2.5 g Mannitol 0.25 g Soy lecithin 0.25 g α -tocopherol (in 5 ml of ethanol) 0.25 g CAP 45 ml Distilled water
A3	2.5 g WPs 0.5 g Retinyl palmitate 50 ml Whole milk
B3	2.5 g WPs 0.5 g β -carotene 50 ml Whole milk

C3	2.5 g WPs 0.5 g Retinyl acetate 50 ml Whole milk
D3	2.5 g WPs 0.1 g Cholecalciferol 50 ml Whole milk
E3	2.5 g WPs 0.25 g α -tocopherol 50 ml Whole milk

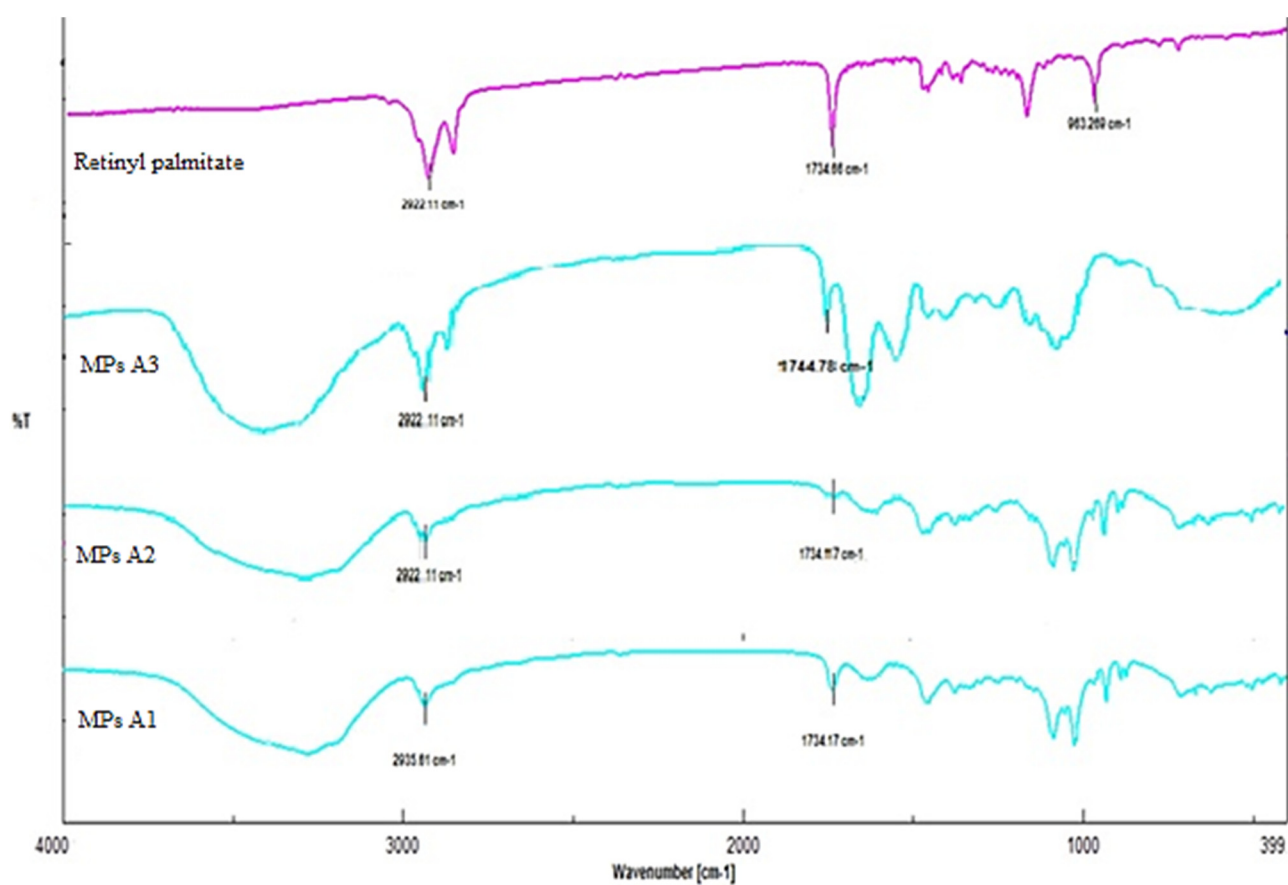


Figure S1. FTIR spectra of pure retinyl palmitate and MP formulations A1 (Eudraguard Biotic), A2 (CAP) and A3 (WPs).

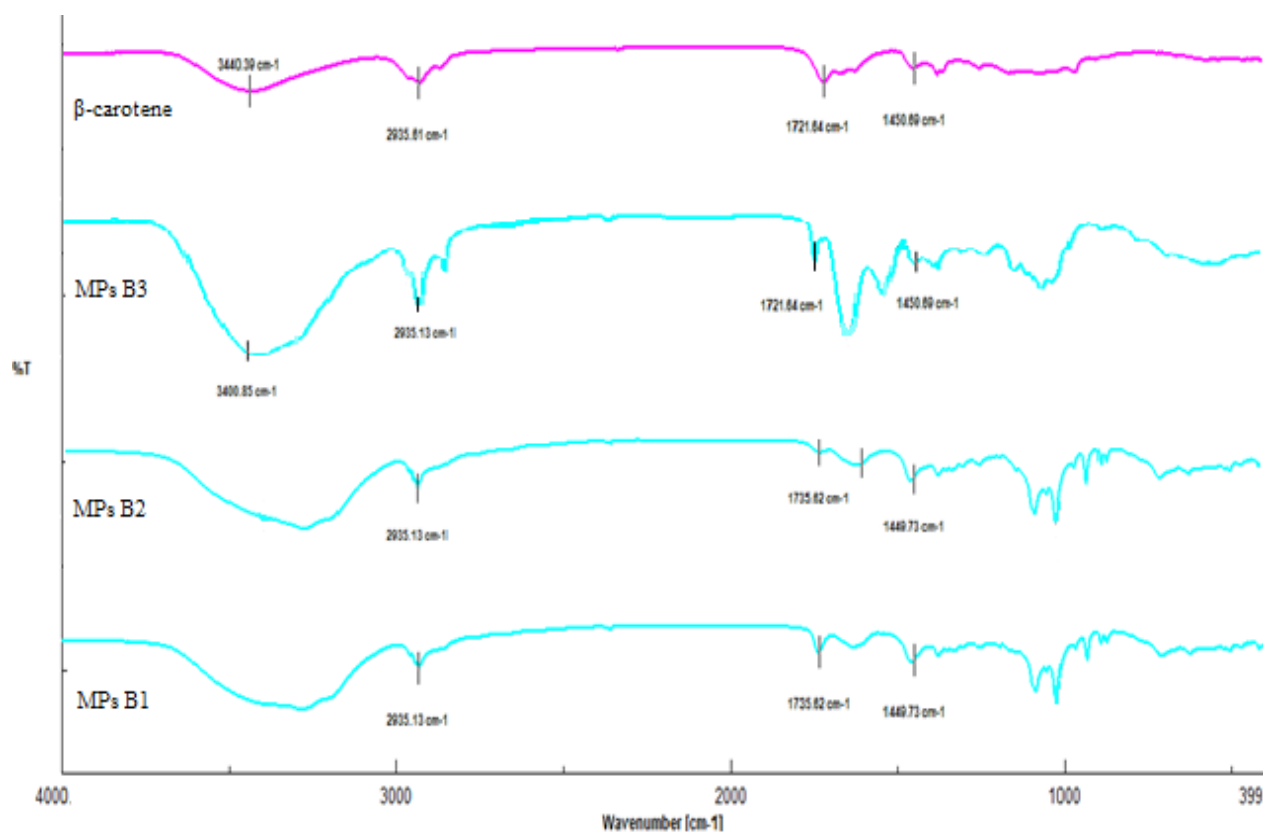


Figure S2. FTIR spectra of pure β -carotene and MP formulations B1 (Eudraguard Biotic), B2 (CAP) and B3 (WPs).

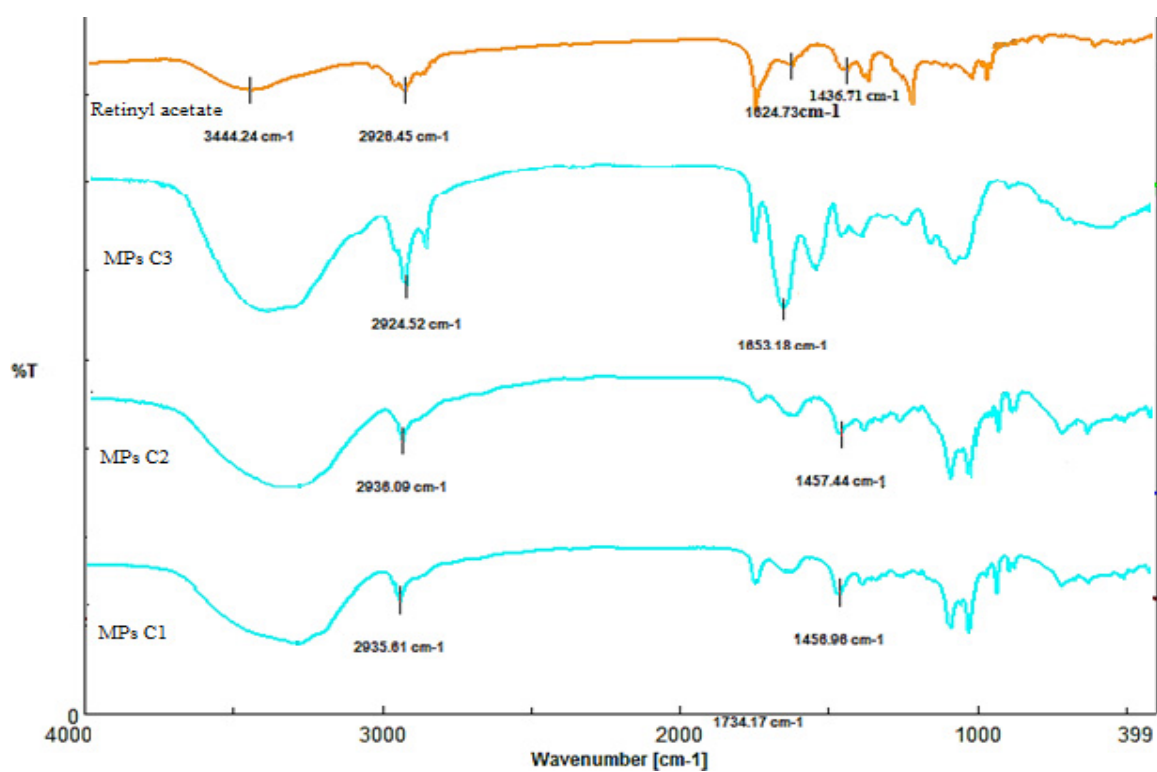


Figure S3. FTIR spectra of pure retinyl acetate and MP formulations C1 (Eudraguard Biotic), C2 (CAP) and C3 (WPs).

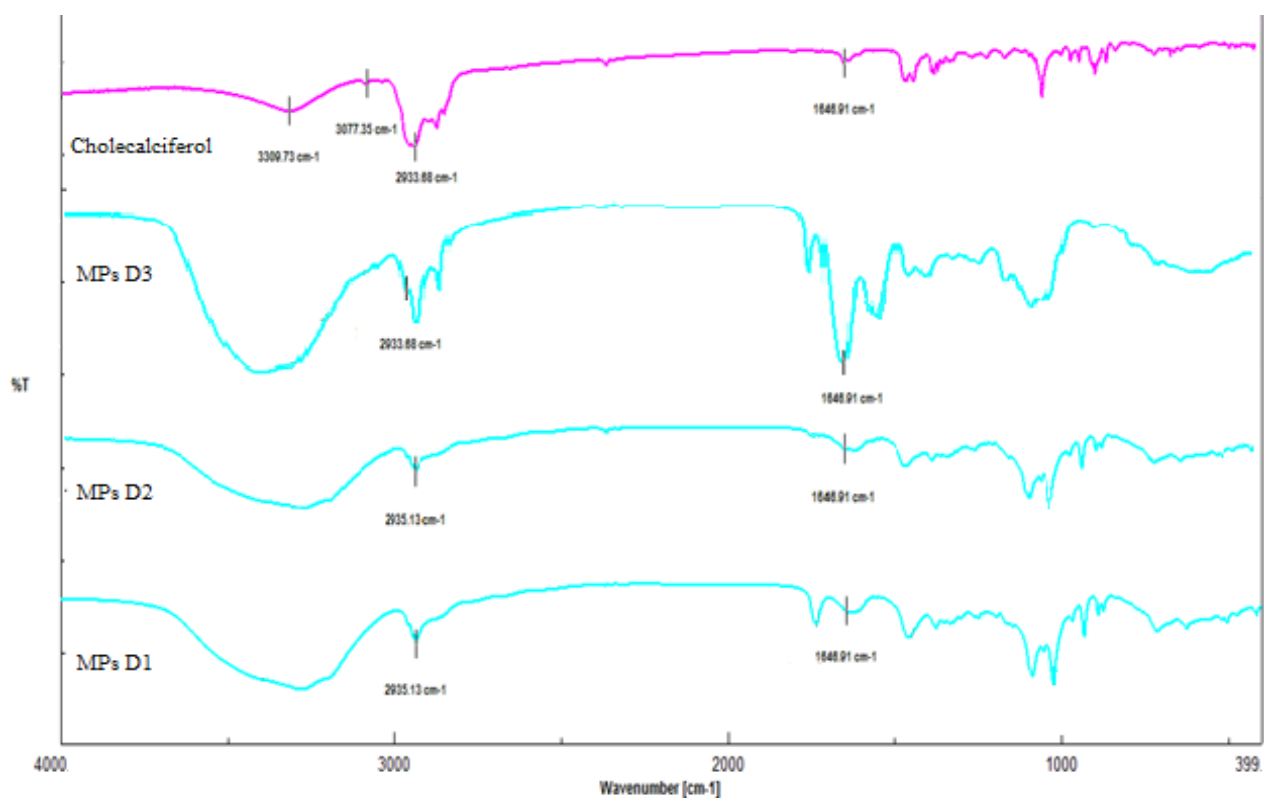


Figure S4. FTIR spectra of pure cholecalciferol and MP formulations D1 (Eudraguard Biotic), D2 (CAP) and D3 (WPs).

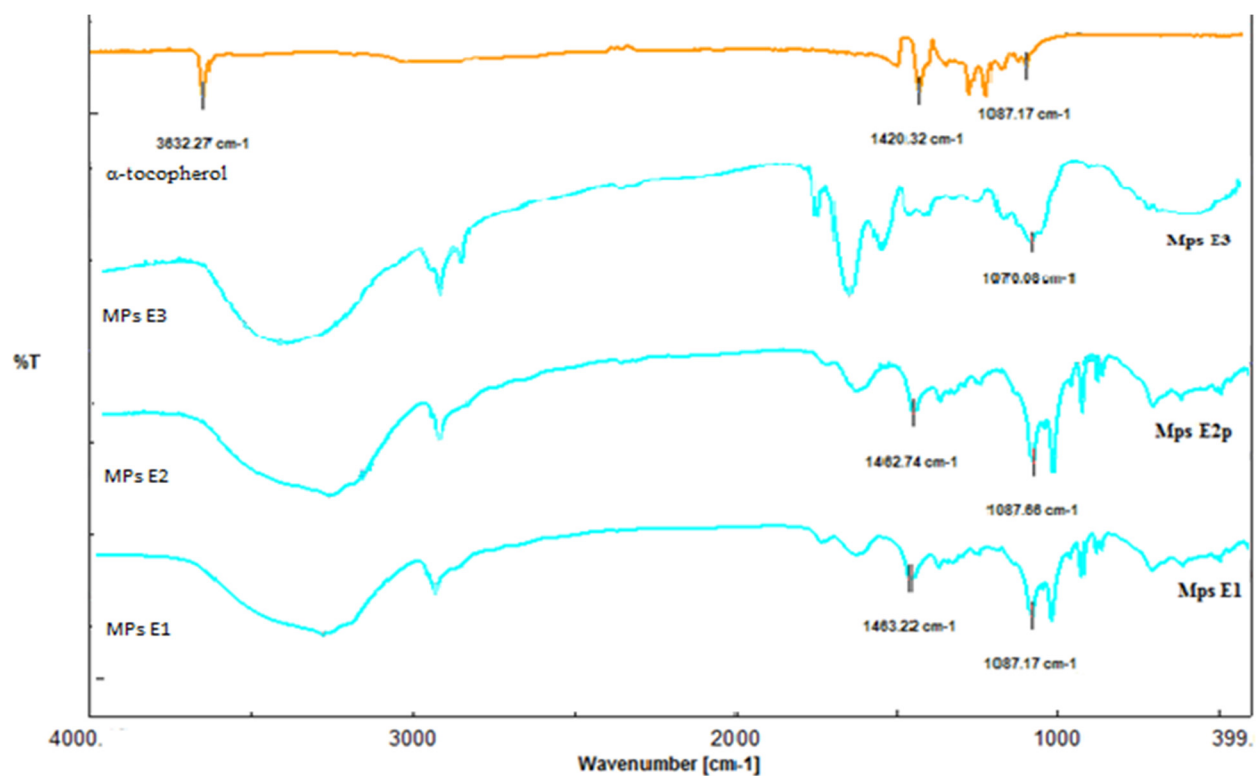


Figure S5. FTIR spectra of pure α -tocopherol and MP formulations E1 (Eudraguard Biotic), E2 (CAP) and E3 (WPs).

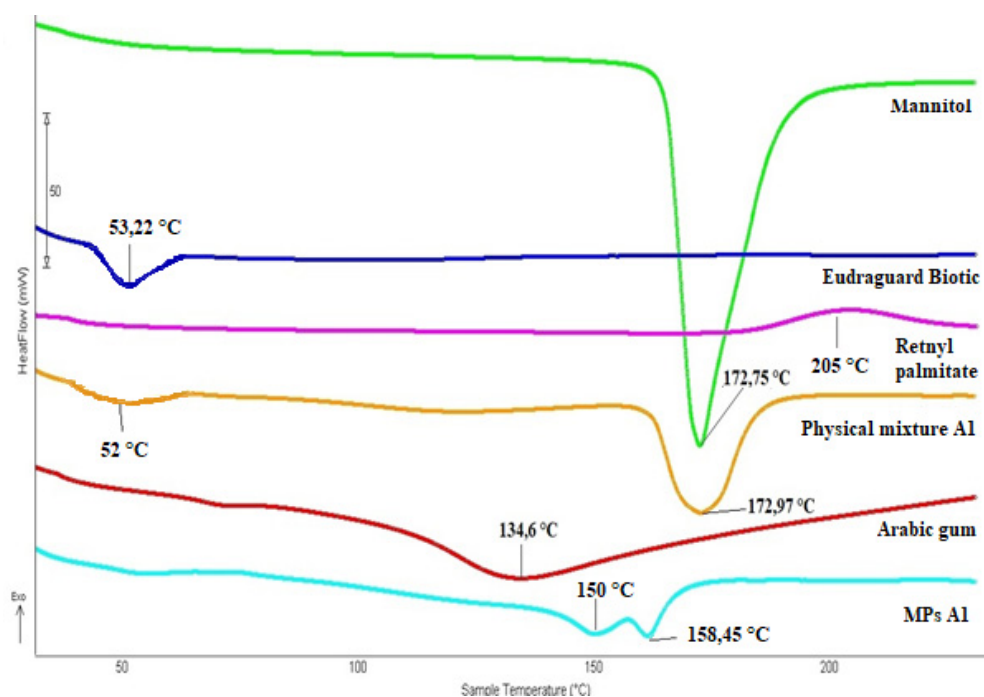


Figure S6. Comparison between the DSC graphs of Mannitol, Eudraguard Biotic, retinyl palmitate, the physical mixture of the compounds presents in the formulation A1 and microparticles (MPs A1).

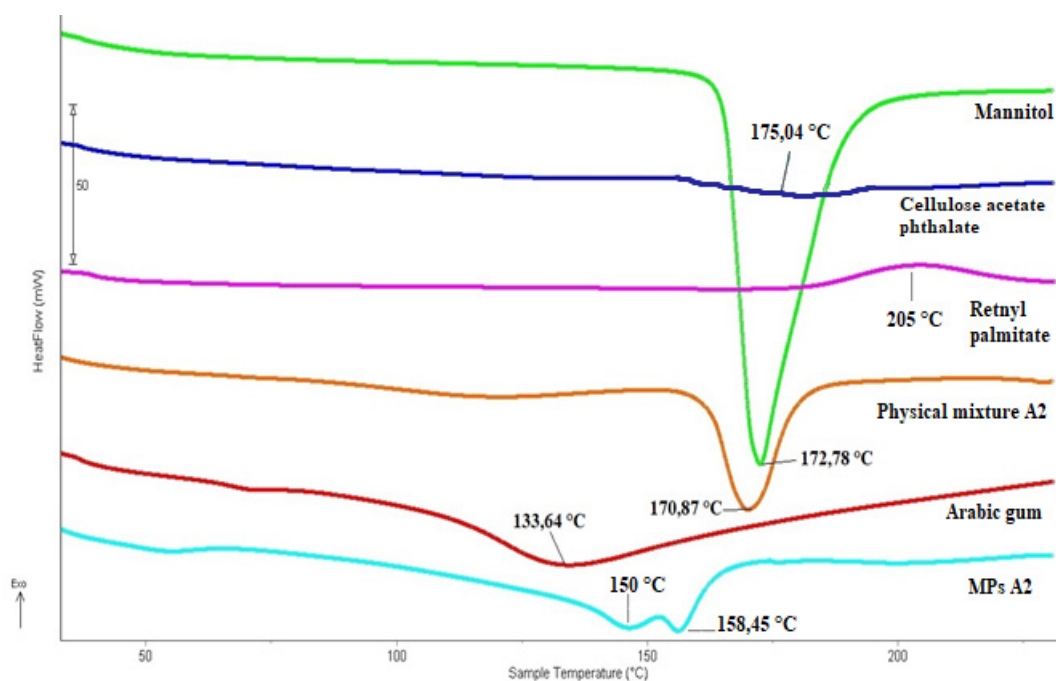


Figure S7. Comparison between the DSC graphs of Mannitol, CAP, retinyl palmitate, the physical mixture of the compounds presents in the formulation A2 and microparticles (MPs A2).

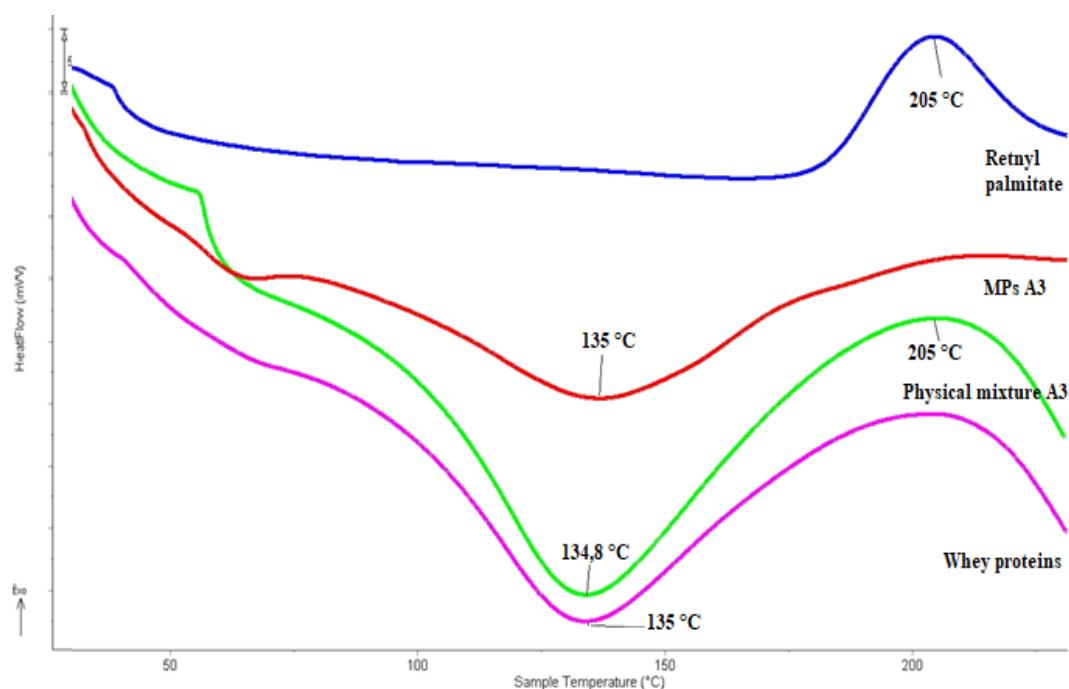


Figure S8. Comparison between the DSC graphs of WPs, retinyl palmitate, the physical mixture of the compounds presents in the formulation A3 and microparticles (MPs A3).

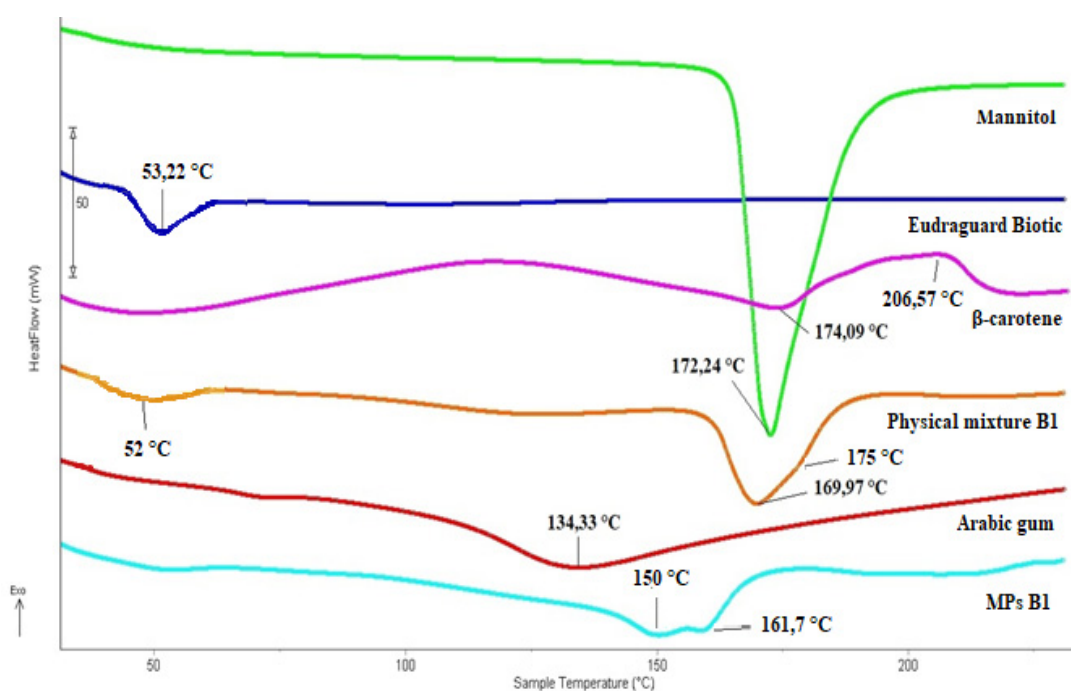


Figure S9. Comparison between the DSC graphs of mannitol, Eudraguard Biotic, β -carotene, the physical mixture of the compounds present in the formulation B1 and microparticles (MPs B1).

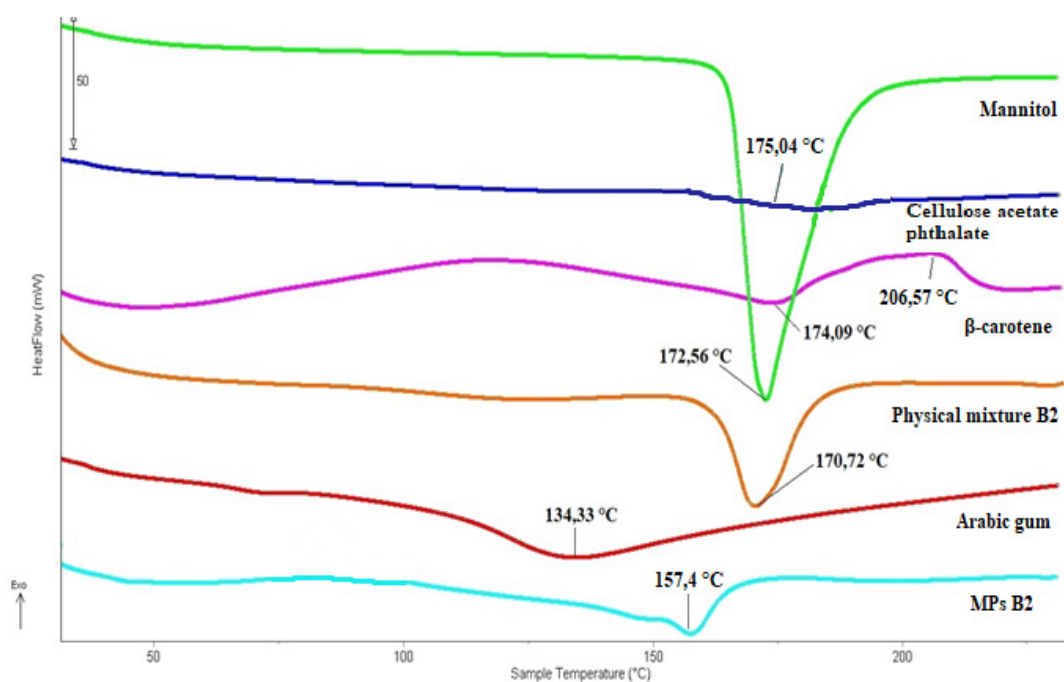


Figure S10. Comparison between the DSC graphs of mannitol, CAP, β -carotene, the physical mixture of the compounds presents in the formulation B2 and microparticles (MPs B2).

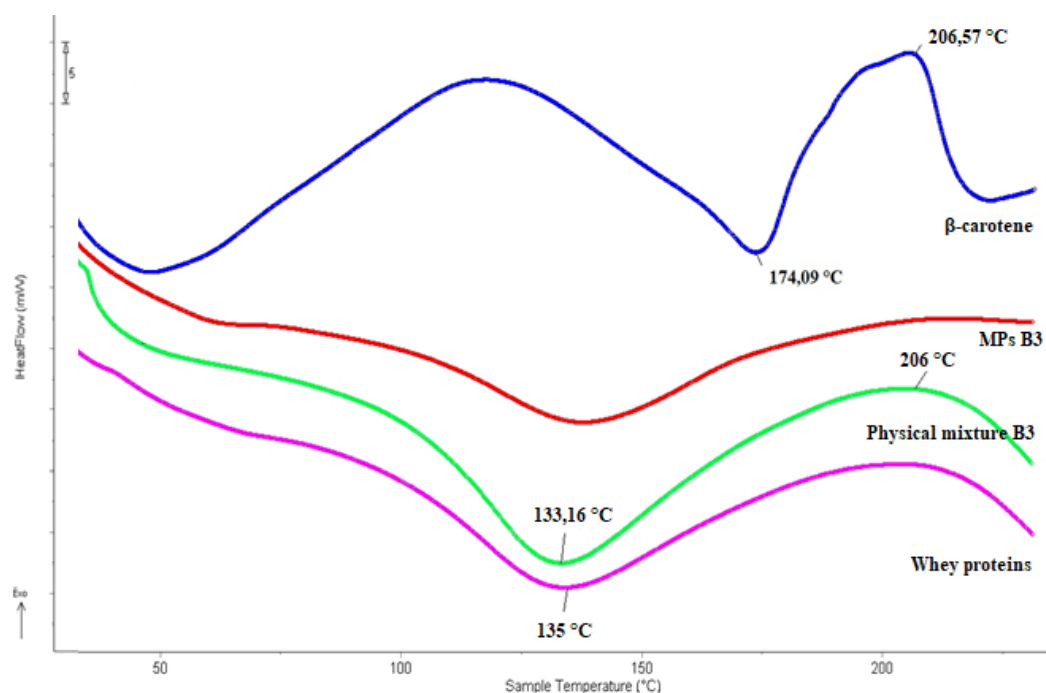


Figure S11. Comparison between the DSC graphs of WPs, β -carotene, the physical mixture of the compounds presents in the formulation B3 and microparticles (MPs B3).

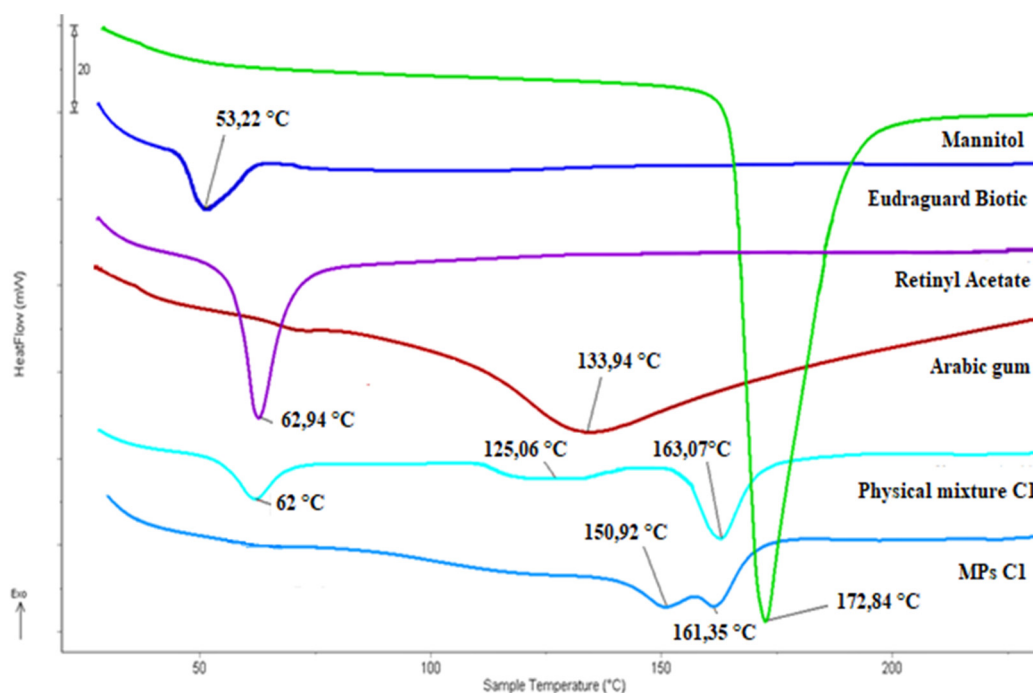


Figure S12. Comparison between the DSC graphs of mannitol, Eudraguard Biotic, retinyl acetate, the physical mixture of the compounds presents in the formulation C1 and microparticles (MPs C1).

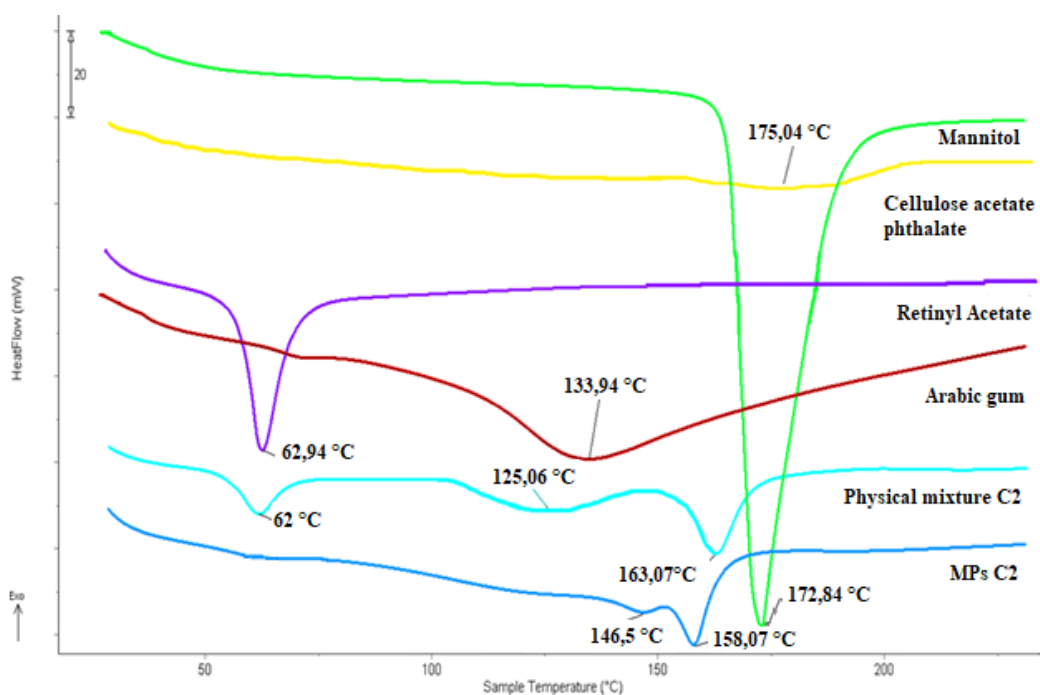


Figure S13. Comparison between the DSC graphs of mannitol, CAP, retinyl acetate, the physical mixture of the compounds presents in the formulation C2 and microparticles (MPs C2).

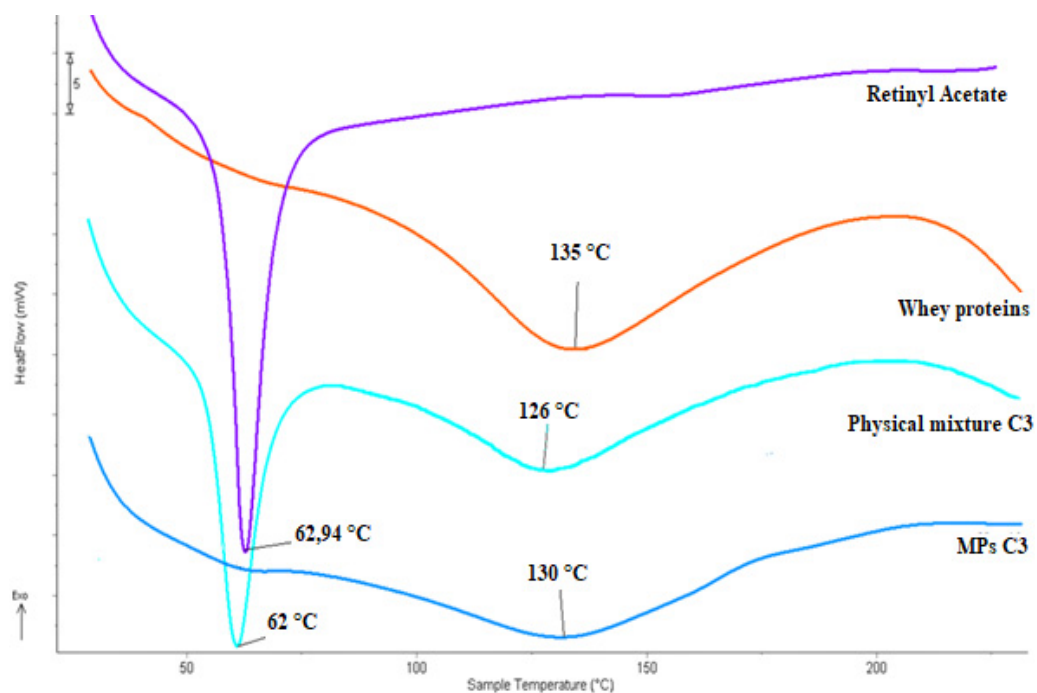


Figure S14. Comparison between the DSC graphs of WPs, retinyl acetate, the physical mixture of the compounds presents in the formulation C3 and microparticles (MPs C3).

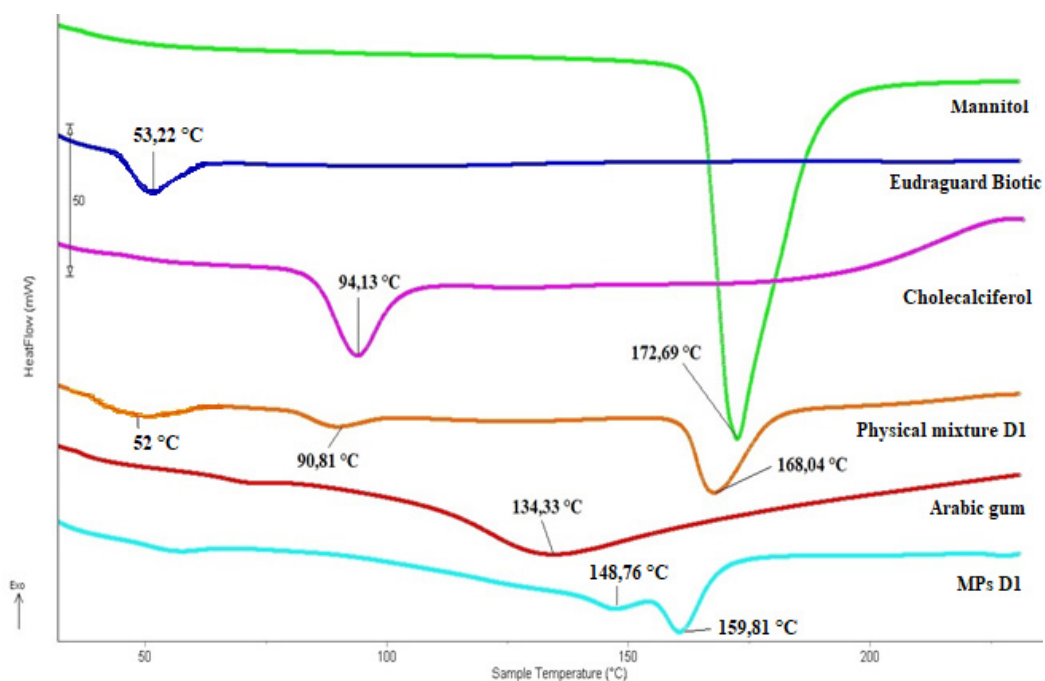


Figure S15. Comparison between the DSC graphs of mannitol, Eudraguard Biotic, cholecalciferol, the physical mixture of the compounds presents in the formulation D1 and microparticles (MPs D1).

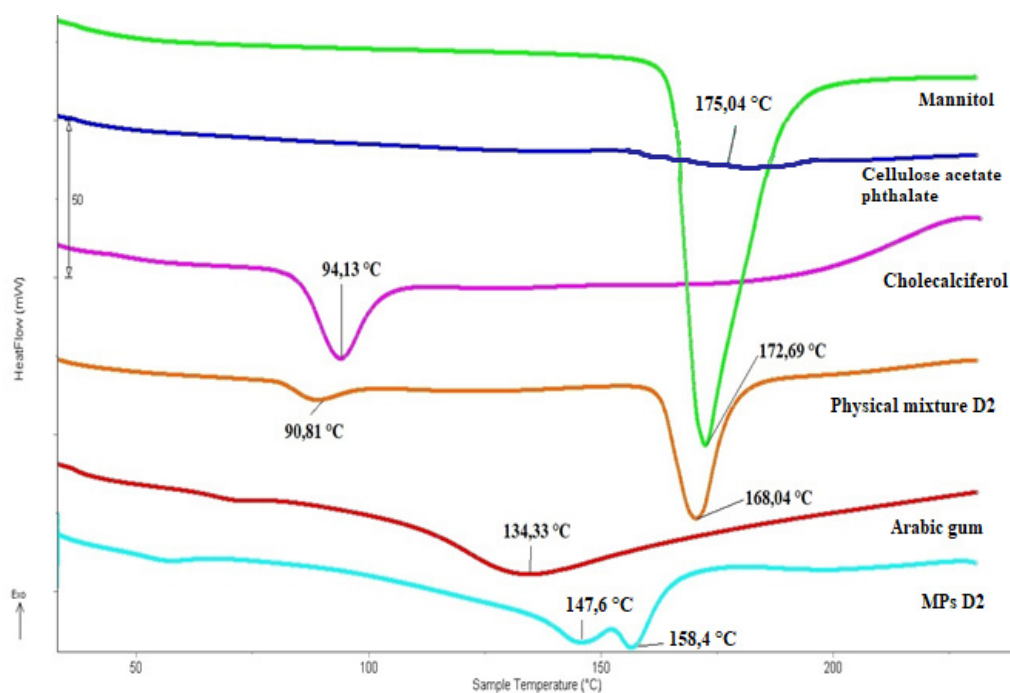


Figure S16. Comparison between the DSC graphs of mannitol, CAP, cholecalciferol, the physical mixture of the compounds presents in the formulation D2 and microparticles (MPs D2).

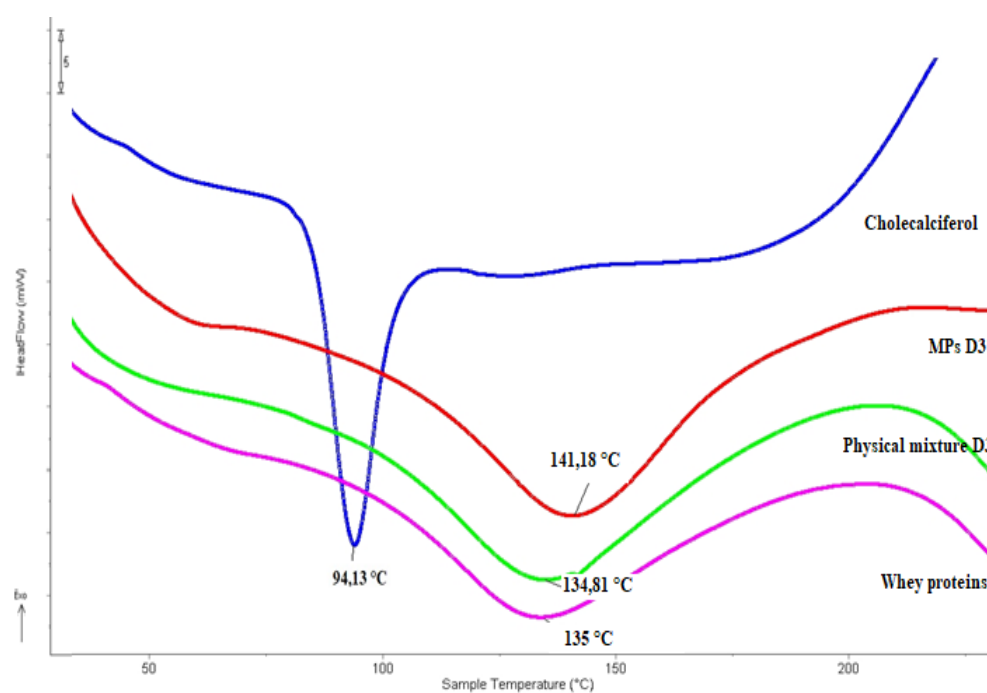


Figure S17. Comparison between the DSC graphs of WPs, cholecalciferol, the physical mixture of the compounds presents in the formulation D3 and microparticles (MPs D3).

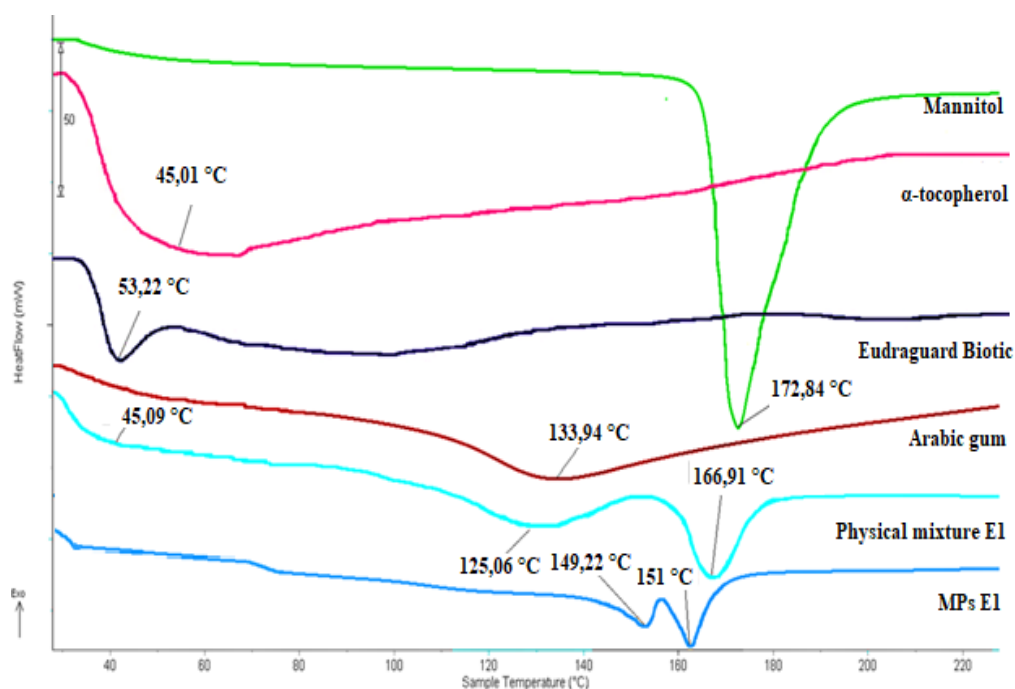


Figure S18. Comparison between the DSC graphs of mannitol, Eudraguard Biotic, α -tocopherol, the physical mixture of the compounds presents in the formulation E1 and microparticles (MPs E1).

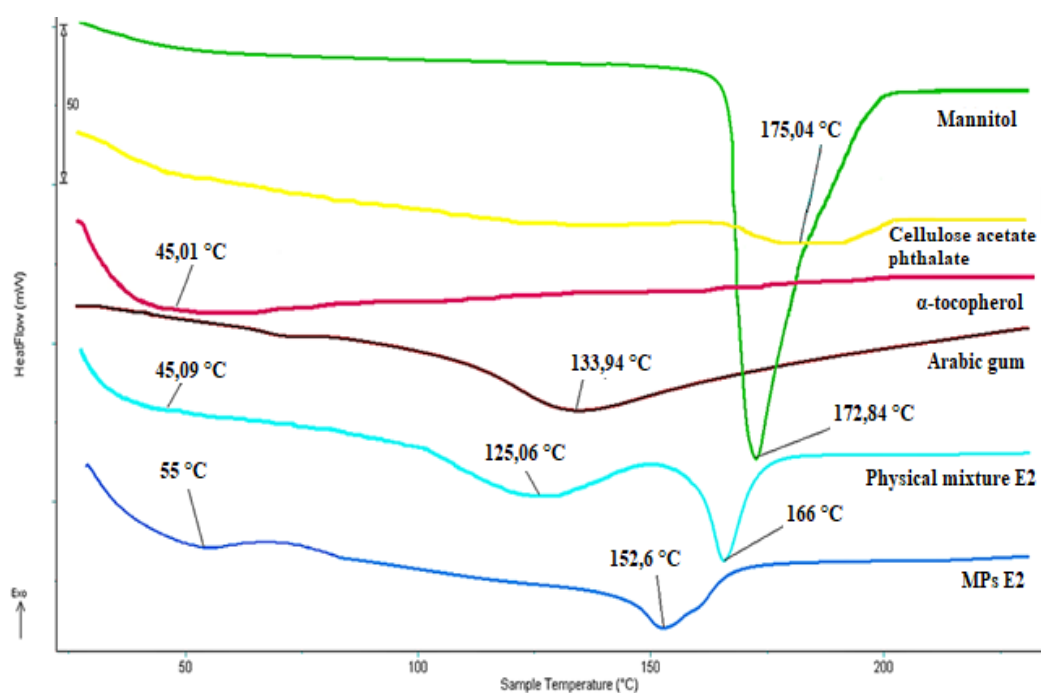


Figure S19. Comparison between the DSC graphs of mannitol, CAP, α -tocopherol, the physical mixture of the compounds presents in the formulation E2 and microparticles (MPs E2).

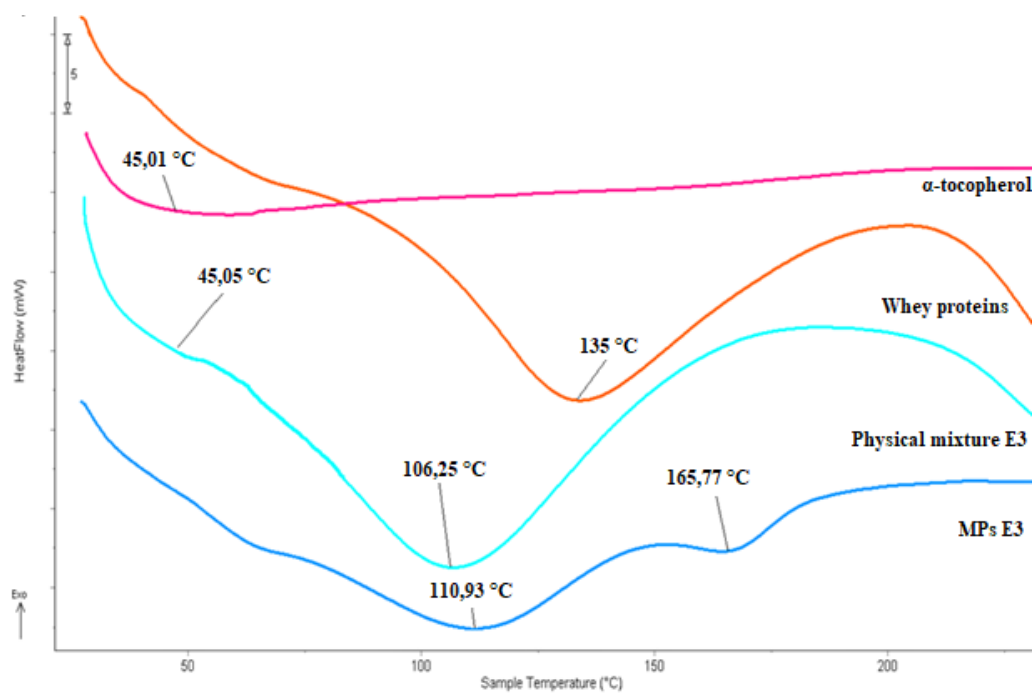


Figure S20. Comparison between the DSC graphs of WPs, α -tocopherol, the physical mixture of the compounds presents in the formulation E3 and microparticles (MPs E3).