applied sciences

MDPI

The Effect of Eugenol and Chitosan Concentration on the Encapsulation of Eugenol Using Whey Protein–Maltodextrin Conjugates

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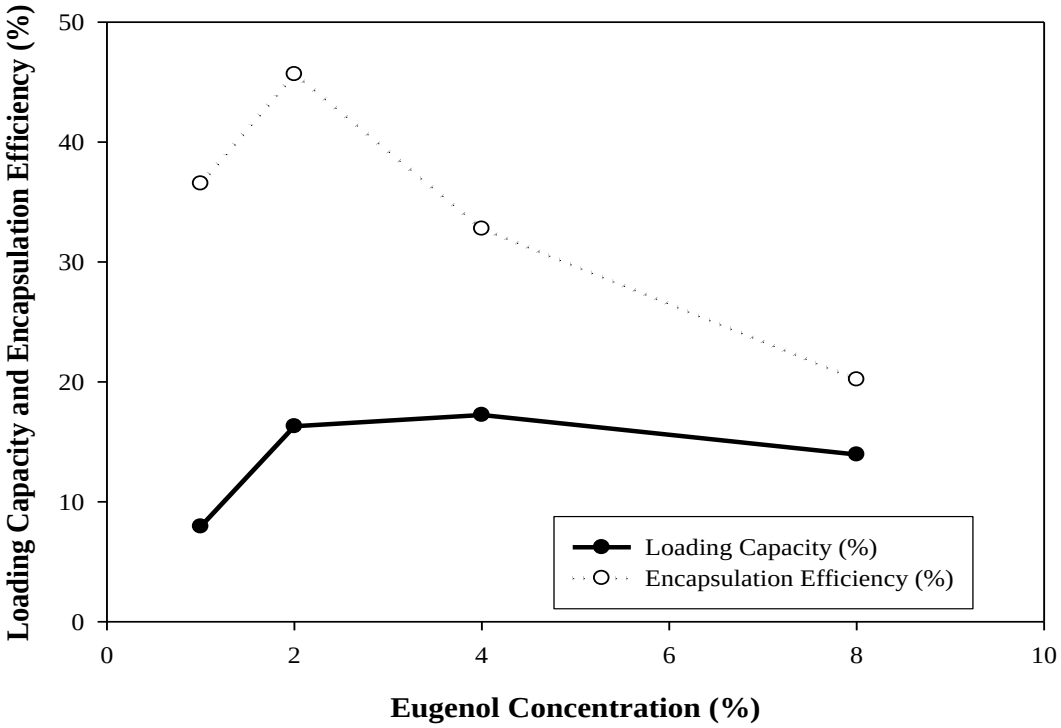

Figure S1. Encapsulation efficiency and loading capacity of eugenol microcapsules loading with various concentration of eugenol.

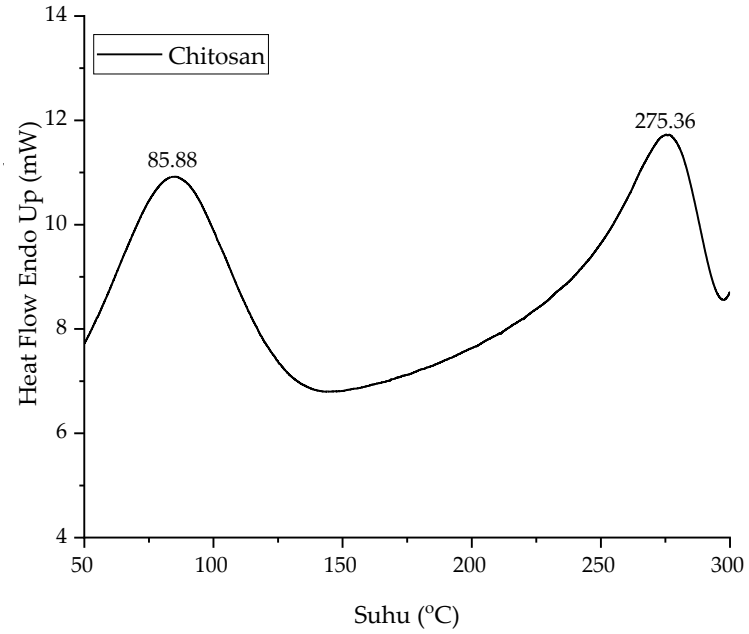

Figure S2. DSC thermogram of chitosan powder.

Table S1. IR band WPMD conjugate, eugenol and chitosan obtained from the FTIR analysis.

Sample	IR band (cm^{-1})	Reference of	
		Group frequency wavenumber (cm^{-1})	Assignment
WPMD Conjugates	3295	3570-3200	Hydroxy group, H bonded OH
	2922	2850-3000	C-H bonds
	1640	1650-1590	Primary amine, NH bend
	1360	1350-1300	C-N bond
Eugenol	3516,3075,3003	1510-1450	Aromatic ring stretch
	2974,2905,2938,2841	1650-1590	NH Bend
	1637, 1607	1550-1640	NH bend
	1510	1510	C-C aromatic ring
	1462,1452,1430		
	1365		
Chitosan	3291		
	2880		
	1641		
	1577		
	1381		

Table S2. IR band and % transmittance of F1 samples.

	% Transmittance of Samples Formula F1				References*)[1]	
IR Band (cm^{-1})	WPMD-Chi 0%	WPMD-Chi 0.2%	WPMD-Chi 0.6%	WPMD-Chi 1.0%	Group frequency wavenumber (cm^{-1})	Description
3295-3287	83	83	83-84	84-85	3750-3200	Hydroxy group, O
2920-2924	91-93	90	89-90	89-90	2920	C-H stretching,CH_2 [2]
1700-1735	97-98	96-98	96-97	96-97	1700-1725	Carboxylic acid
1639-1646	93	92	91	91	1650-1550	Secondary amine, NH bend
1589-1596	93	90	87	88	1650-1590	Primary amine, NH bend
1577-1581	92	89	85	86	1650-1550 1580	Secondary amine, NH bend C-N stretching [3]
1550-1573	92	87-89	82-84	83-85	1650-1550	Secondary amine, NH bend
1508-1519	92	89	84	83	1510	C=C aromatic ring
1450-1492	90-93	87-91	84-88	84-87	1473	C-H stretching of methyl group [4]
1423-1430	87-89	84-85	80-81	80-81	1430	CH, CH-O-H [2]
1408-1419	87	83	79	80	1410-1310	Phenol, OH bend
1261-1268	89	86	83	82	1260-1350	Primary or secondary, OH in plane bend
1010-1014	56	47	43	44	1000-1200	Region of carbohydrate
995-998	60-58	51-49	49-46	50-48	558-998	C-H bending of aromatic group
559-641	76-77	72-70	68-66	70-68	720-590	Alcohol[a)] , aromatic ring

[a)][1]Coates (2000)

Table S3. IR band and % transmittance of F2 samples.

	% Transmittance of Samples Formula F2				References	
IR Band (cm^{-1})	WPMD-Chi 0%	WPMD-Chi 0.2%	WPMD-Chi 0.6%	WPMD-Chi 1.0%	Group frequency wavenumber (cm^{-1})	Description
3271-3295	96	93	98	94	3750-3200	Hydroxy group, O
2919-2927	98	97	98	96	2920	C-H stretching,CH_2 [2]
2341-2352	98	98	97	96		
1700-1735	99	99	99	99	1700-1725	Carboxylic acid
1639-1658	99	99	100	98	1650-1550	Secondary amine, NH bend
1600-1619	99	98	99	97		
1589-1658	99	99	100	98	1650-1590	Primary amine, NH bend
1573-1589	99	98	99	97	1650-1550 1580	Secondary amine, NH bend C-N stretching [3]
1550-1573	100-99	100-99	98-97	96	1650-1550	Secondary amine, NH bend
1500-1519	100	99-100	100	98-97	1510	C=C aromatic ring
1400-1419	98	95	98	93-94	1410-1310	Phenol, OH bend
1303-1349	98	96	98	95		
1261-1349	98	96	99-98	96-94	1260-1350	Primary or secondary, OH in plane bend
1002-1014	88	80	93	77	1000-1200	Region of carbohydrate
852-929	97	95	98	94-92	558-998	C-H bending of aromatic group
582-609	94-95	93	98	89-90	720-590	Alcohol , aromatic ring

References

1. Coates, J. Interpretation of Infrared Spectra, A Practical Approach. 2006; 10.1002/9780470027318.a5606.
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