

**Encapsulation of lipophilic fragrance by Polymerization of the intermediate aqueous  
phase of an oil-in-water-in-oil (O/W/O) double emulsion**

Margot Stasse<sup>a-b-c</sup>, Tiphaine Ribaut<sup>c</sup>, Véronique Schmitt <sup>\*b</sup> and Valérie Héroguez <sup>\*a</sup>

*<sup>a</sup>Laboratoire de Chimie des Polymères Organiques, CNRS, UMR 5629, Bordeaux, 16 Avenue  
Pey-Berland, F-33607 Pessac, France*

*<sup>b</sup>Centre de Recherche Paul Pascal, UMR 5031 University of Bordeaux CNRS 115 avenue du  
Dr Albert Schweitzer 33600 Pessac, France*

*<sup>c</sup>Takasago Europe Perfumery Laboratory 12 rue Torricelli 75017 PARIS, France*

\*CORRESPONDING AUTHOR :

Valérie Héroguez, Université de Bordeaux, LCPO, UMR 5629, F-33600 Pessac, France.

CNRS, LCPO, UMR 5629, F-33600 Pessac, France

Tel: +33 (0) 5 40 00 22 28

Fax: +33 (0) 5 40 00 84 87

Email: [heroguez@enscbp.fr](mailto:heroguez@enscbp.fr)

Véronique Schmitt, Centre de Recherche Paul Pascal, UMR 5031 University of Bordeaux  
CNRS 115 avenue du Dr Albert Schweitzer 33600 Pessac, France

Tel : +33 (0)5 84 56 67

Fax : +33 (0)5 84 56 00

Email : [veronique.schmitt@crpp.cnrs.fr](mailto:veronique.schmitt@crpp.cnrs.fr)

Table S1: Composition of fragrance A. T<sub>b</sub> : Boiling Temperature.

<b>Perfumery name</b>	<b>Chemical name</b>	<b>wt %</b>	<b>Molecular Weight (g/mol)</b>	<b>LogP</b>	<b>T<sub>b</sub> (°C)</b>
ALDEHYDE C12 LAURIC	Dodecanal	5	184.32	5.07	257
TH LINALOOL	3,7-dimethyloctan-3-ol	15	158.28	3.52	155
HEDIONE	methyl 2-(3-oxo-2-pentylcyclopentyl)acetate	20	226.32	2.91	110 (0.2 mmHg)
METHYL HEXYL KETONE	2-Octanone	10	128.22	2.44	173
BOISAMBRENE	Ethoxymethyl-cyclododecyl ether	5	242.40	5.48	94 (1 mmHg)
DIMETHYL ANTHRANILATE	Methyl N-methylantranilate	5	165,19	2.66	256
DECALACTONE	5-Hexyloxolan-2-one	10	170,25	2.36	270
CLONAL	Dodecane nitrile	5	181.32	4.90	277
EUCALYPTOL	1,3,3-triméthyl-2-oxabicyclo[2,2,2]octane	5	154.25	2.91	176
ISO BORNYL ACETATE	1,7,7-Trimethylbicyclo[2.2.1]hept-2-yl acetate	20	196.29	4.04	225

Table S2: Composition of fragrance B. T<sub>b</sub> : Boiling Temperature.

Perfumery name	Chemical name	wt %	Molecular Weight (g/mol)	LogP	T <sub>b</sub> (°C)
HEXENYL ACETATE CIS 3	cis-3-Hexenyl acetate	5	142.20	2.34	167
TRIPLAL	2,4-dimethylcyclohex-3-ene-1-carbaldehyde	5	138.21	2.36	196
EUGENOL	2-methoxy-4-(2-propenyl)-phenol	5	164.20	2.40	254
CYCLACET	Tricyclododecenyl Acetate	10	192.26	2.88	295
CITRAL	3,7-dimethylocta-2,6-dienal	5	152.24	2.95	229
CITRONELLOL 950	3,7-Dimethyloct-6-en-1-ol	5	156.27	3.25	225
ALLYL HEPTANOATE	prop-2-enyl heptanoate	5	170.25	3.60	210
DAMASCONE DELTA	1-(2,6,6-trimethyl-1-cyclohex-3-enyl)but-2-en-1-one	2	192.30	3.62	256
IONONE BETA	4-(2,6,6-trimethyl-1-cyclohexene-1-yl)-3-butene-2-one	5	192.30	3.71	259.5
ALDEHYDE C11 UNDECYLENIC	10-undecenal	5	168.28	4.05	223
VERDOX	(2-tert-butylcyclohexyl) acetate	38	198.31	4.06	221
ISORALDEINE 70	1-(2,6,6-trimethyl-2-cyclohexen-1-yl)penten-3-one	5	206.33	4.23	285
HEXYL CINN ALD	2-Benzylideneoctanal	5	216.32	5.00	318

Equations S1: Expressions of the corrective factors

$$f = 1,017 - 1,334\left(\frac{r}{v^3}\right) + 1,477\left(\frac{r}{v^3}\right)^2 - 0,471\left(\frac{r}{v^3}\right)^3 \quad \text{for } \left(\frac{r}{v^3}\right) < 0,4 \quad (1)$$

$$f = 0,9 - 0,71\left(\frac{r}{v^3}\right) + 0,4245\left(\frac{r}{v^3}\right)^2 \quad \text{for } \left(\frac{r}{v^3}\right) < 0,4 \quad (2)$$

$$v = \frac{m}{\rho} \quad (3)$$

Figure S1: Comparison of the globules' size of the reverse emulsion prepared with 25w% and 50w% of HEMA in the water phase

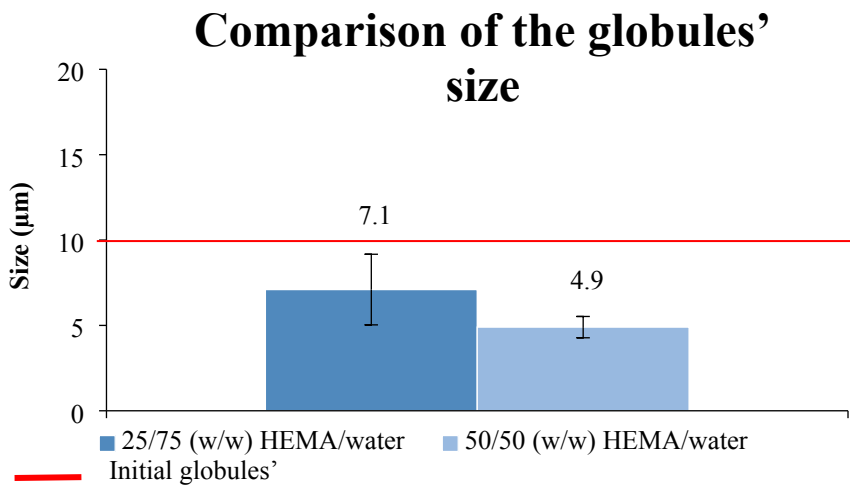


Figure S2: DSC of OEGMA macromonomer

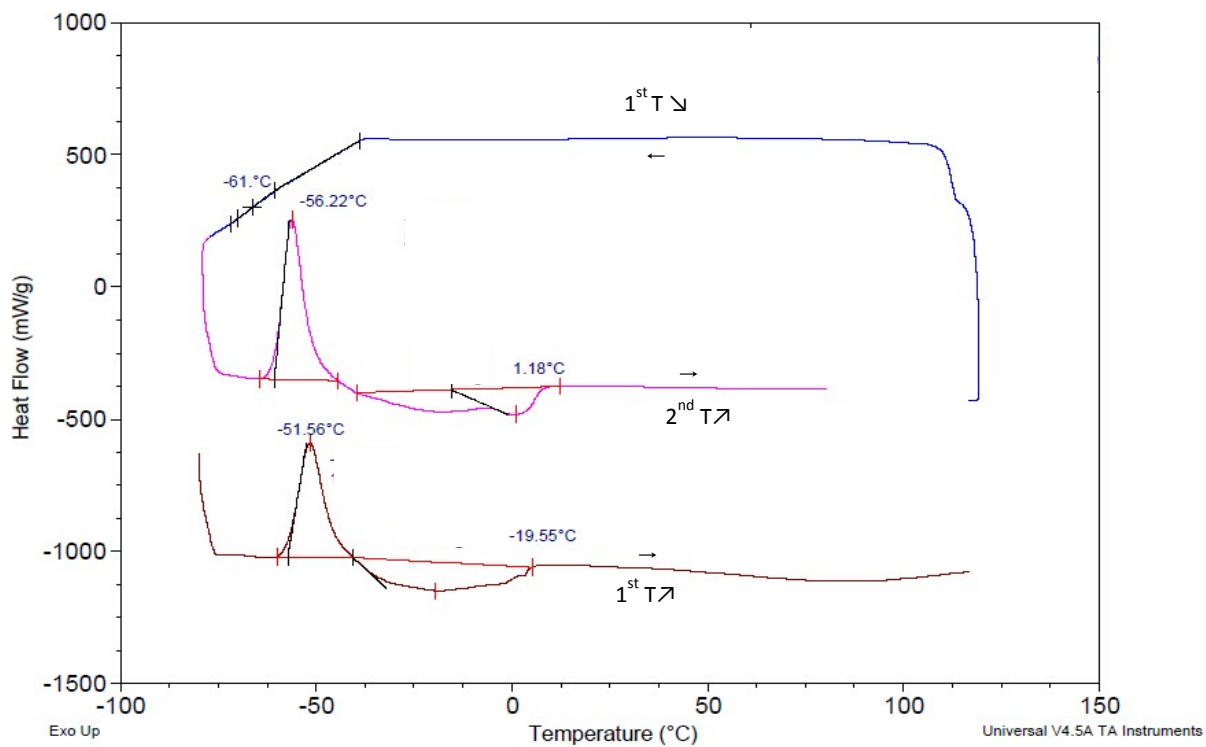


Figure S3: Observation by optical microscopy of Collapse in OEGMA/B, OEGMA/A and MAM/B O/W/O polymerized emulsions in IPM

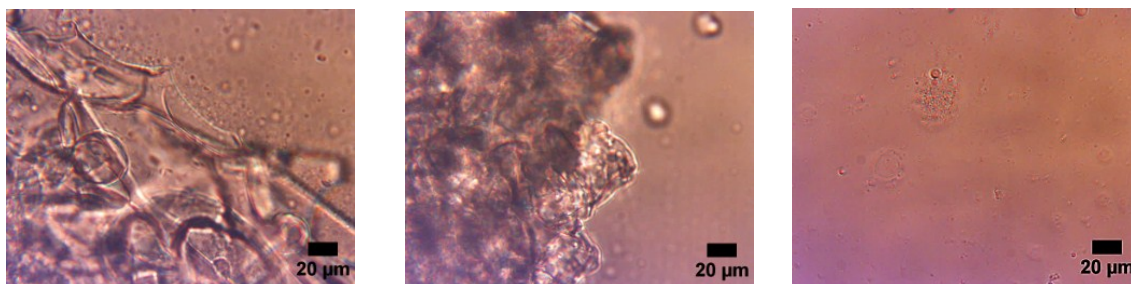


Figure S4: DSC of polymerized a) OEGMA/B, b) OEGMA/A and c) MAM/B in O/W/O emulsions

