

Supplementary Material

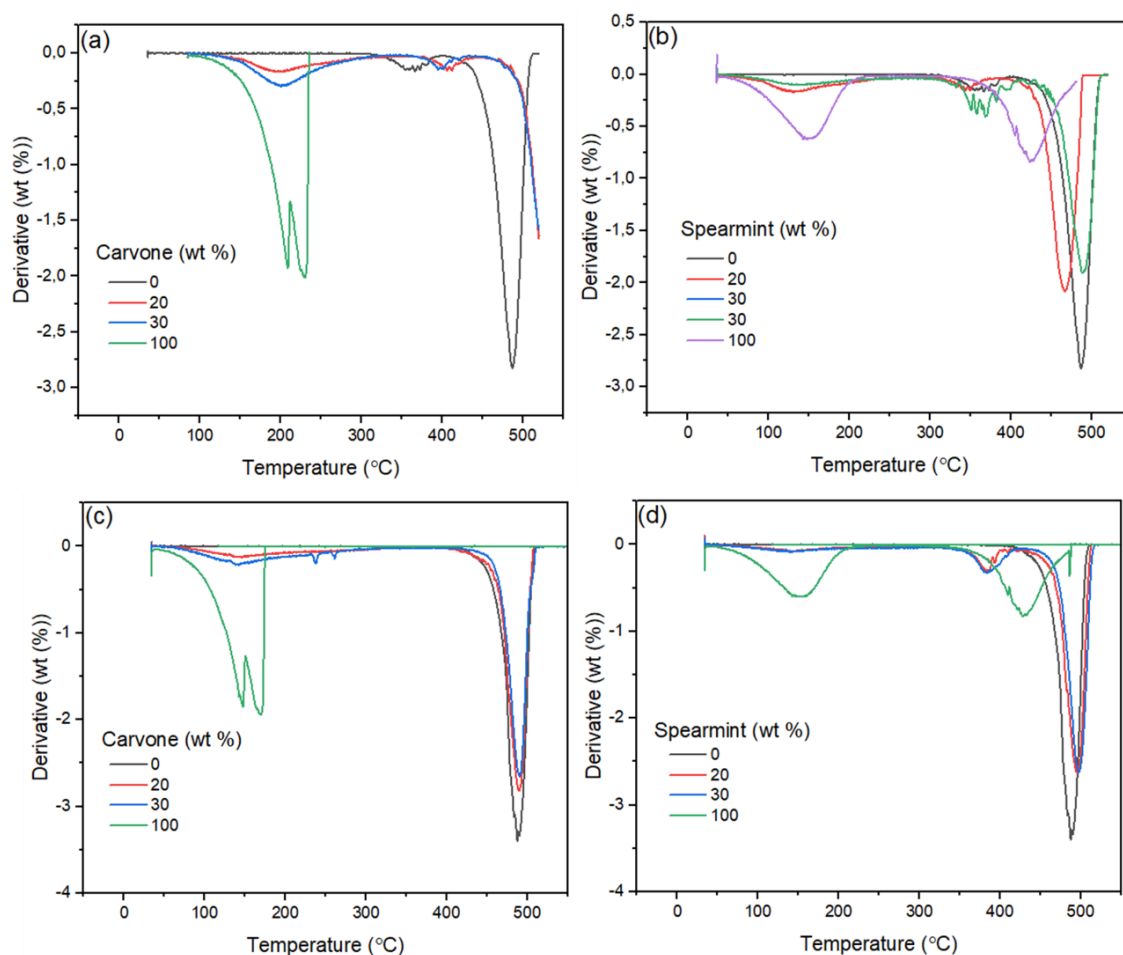


Figure 1: DTA plots of: (a) neat carvone, neat EVA and EVA strands initially containing 20 or 30 wt-% of carvone and 5 wt.% Dellite 43B clay, (b) neat spearmint essential oil, neat EVA and EVA strands initially containing 20 or 30 wt-% of spearmint essential oil and 5 wt.% Dellite 43B clay, (c) neat carvone, neat LLDPE strands and LLDPE strands initially containing 20 or 30 wt-% of carvone and 5 wt.% Dellite 43B clay, (d) neat spearmint essential oil, neat LLDPE and LLDPE strands initially containing 20 or 30 wt-% of spearmint essential oil and 5 wt.% Dellite 43B clay

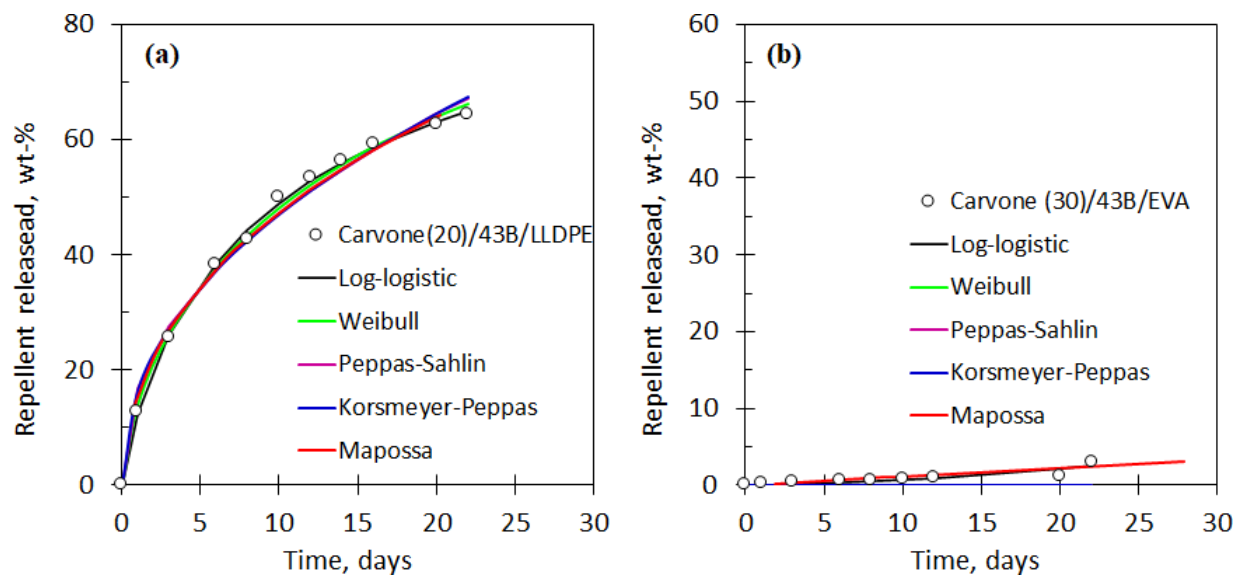


Figure 2: (a) Release rate of carvone (20 wt-%) from LLDPE fits using Korsmeyer-Peppas, Mapossa, Weibull, Peppas-Sahlin and Log-logistic models. (b) Release rate of carvone (30 wt-%) from EVA fits using Mapossa and Log-logistic models. All samples contained 5 wt-% of Dellite 43B clay.

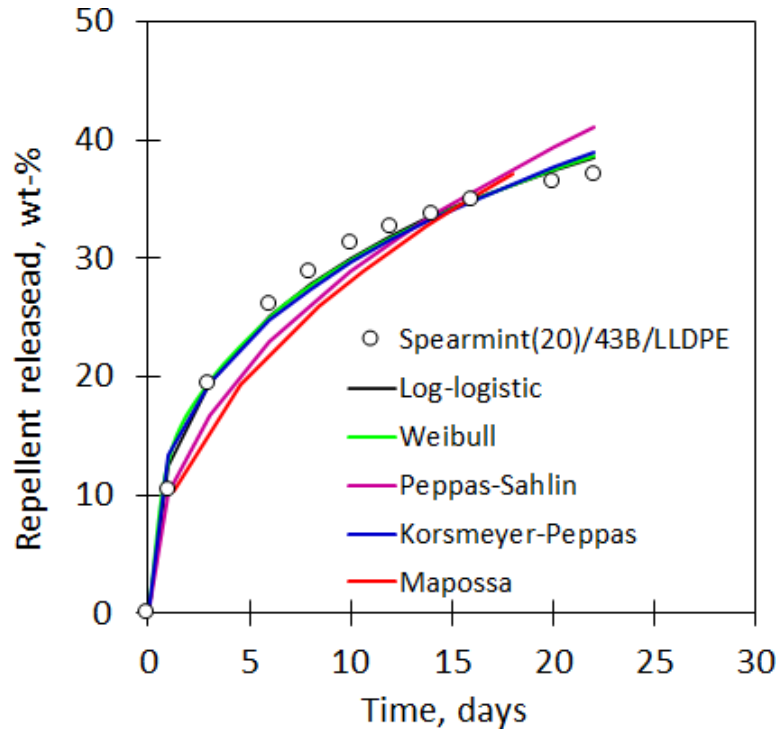


Figure 3: (a) Release rate of spearmint (20 wt-%) from LLDPE fits using Korsmeyer-Peppas, Mapossa, Weibull, Peppas-Sahlin and Log-logistic models. All samples contained 5 wt-% of Dellite 43B clay.

Table 1. Fit parameters for the Peppas-Sahlin, Korsmeyer-Peppas and Mapossa models

Sample	Peppas-Sahlin		Korsmeyer-Peppas				Mapossa		
	τ_1	τ_2	r	τ	n	r	κ_1	κ_2	r
Carvone (20)/43B/LLDPE	3.97	32.2	0.9951	52.3	0.45	0.9950	0.014	1.000	0.9911
Carvone (30)/43B/EVA	220.5	19.7	0.8580	896.7	9.57	0.9291	0.028	3.23	0.8371
Spearmint(20)/43B/LLDPE	5.07	20.01	0.9839	330.6	0.35	0.9925	0.004	1.000	0.9617

Table 2. Fit parameters for the Log-logistic and Weibull models

Sample	Log-Logistic (Hill)			Weibull		
	τ	n	r	τ	n	r
Carvone (20)/43B/LLDPE	10.5	0.84	0.9994	19.4	0.63	0.9986
Carvone (30)/43B/EVA	183.0	1.74	0.8772	322.7	6.29	0.9038
Spearmint(20)/43B/LLDPE	57.8	0.48	0.9960	128.0	0.41	0.9945

Table 3. Instrumental parameters used for the qualitative analysis of the vapour phase composition of spearmint oil adsorbed onto Tenax TA[®] tubes

Thermal desorbtion unit parameters	
Carrier gas	Helium (Afrox, Instrument grade: 99.9999%)
Flow rate	15 mL/min
Desorption time	10 min
Coolant gas	Nitrogen (Afrox, 99.9999%)
Temperature	280 °C, splitter closed
Cryo-focussing	-10 °C, splitter open
GC transferline temperature	190 °C
GC parameters	
Carrier gas	Ultra-pure helium (Afrox, South Africa) at a constant flow rate of 1.2 mL/min
Inlet	250 °C in splitless mode
Column	5%-Phenyl-methylpolysiloxane (DB5) capillary column with dimensions of 60 m length x 250 µm internal diameter and 0.25 µm film thickness (Agilent Technologies)
Oven temperature	Initial temperature 50 °C, raised to 80 °C at 10 °C/min, then the temperature was raised to 130 °C (held for 5 min), and finally increased to 240 °C at 20 °C/min Total run time: 22 min
MS transferline temperature	280 °C
MS parameters	
Acquisition mode	30 to 550 a.m.u
Ionisation mode	Electron Impact 70 eV
Ionisation temperature	230 °C
Quadrupole temperature	150 °C
EM voltage	1800 V