

PALM KLEEN LIQUID AND GEL DETERGENTS

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MPOB INFORMATION SERIES • ISSN 1511-7871 • JUNE 2005

MPOB TT No. 268-270

MPOB TT No. 268 - PALM KLEEN LIQUID DISH WASH

MPOB TT No. 269 - PALM KLEEN GEL DISH WASH

MPOB TT No. 270 - PALM KLEEN HAND WASH

Palm-based sulphonates methyl ester (SME) and fatty alcohol ethoxylated sulphonates (FAES) are anionic surfactants, which are produced from MPOB's pilot plant using Chemithon Technology. These two anionic surfactants were then used to produce liquid detergents, either in liquid or gel form by constructing ternary phase diagram of SME/FAES/sodium chloride solution at 70°C. The phase changes from isotropic to liquid crystalline regions were observed via polarized film and further confirmed their optical pattern using microscope. From the phase diagram, the liquid crystalline region was selected and the composition was used to formulate stable product. Two types of dish washings were formulated, one is liquid and the other is gel given the brand name Palm Kleen Liquid Dish Wash (PKLDW) and Palm Kleen Gel Dish Wash (PKGDW) respectively (Figure 1). A hand wash was also formulated and this is given the brand name Palm Kleen Hand Wash (PKHW). PKHW are enriched with fruity flavour *i.e* lime, citrus and strawberry (Figure 2). The stability of the products was



Figure 2. Palm Kleen hand wash enriched with fruity flavour (citrus, lemon, strawberry).

confirmed by conducting stability test at room temperature and 45°C for three months. The products were confirmed to be stable and the liquid crystalline structures are as shown in Figure 3. Dermal irritation assay test confirmed that the PKLDS, PKGDW and PKHW are non-irritant to the skin (Table 1).

PALM KLEEN LIQUID, GEL DISH WASH AND HAND WASH

The performance of all liquid detergents prepared were measured in terms of cloud point, detergency, foaming power and stability, pH, viscosity and stability test and compared to commercial samples. Figures 4 and 5 showed that the detergencies of PKLDW and PKGDW are higher by 10% to 20% than COM1 and COM2 respectively. Moreover, Palm Kleen formulation is using 14% active as compared to commercials which is 29%. The cloud point of PKGDW is comparable to COM2.

Table 2 shows the pH and foam height/stability of Palm Kleen LDW are comparable to COM1 but it is



Figure 1. Palm Kleen liquid dish wash, gel dish wash and hand wash.

ISSN 1511-7871



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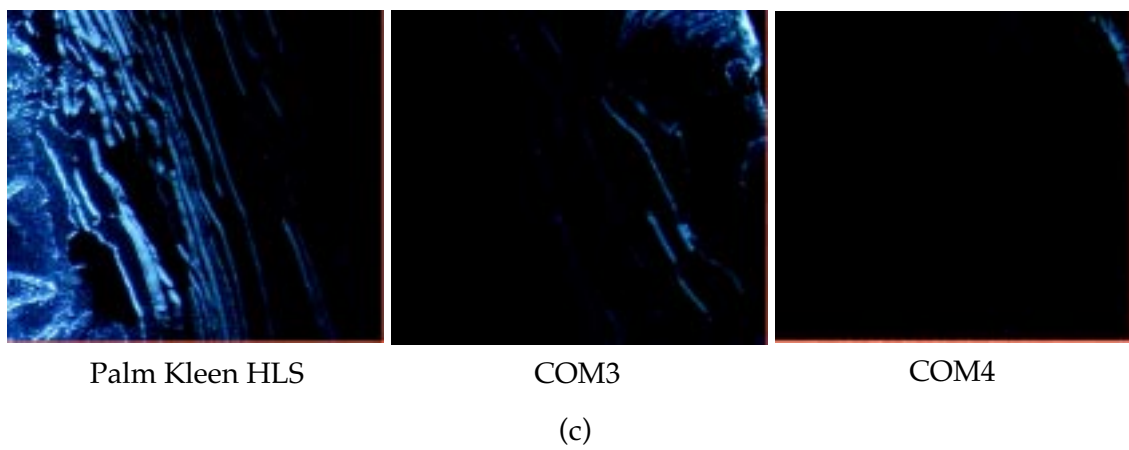
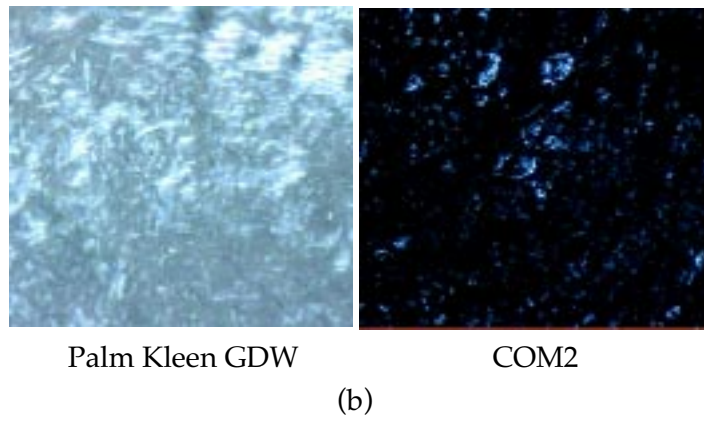
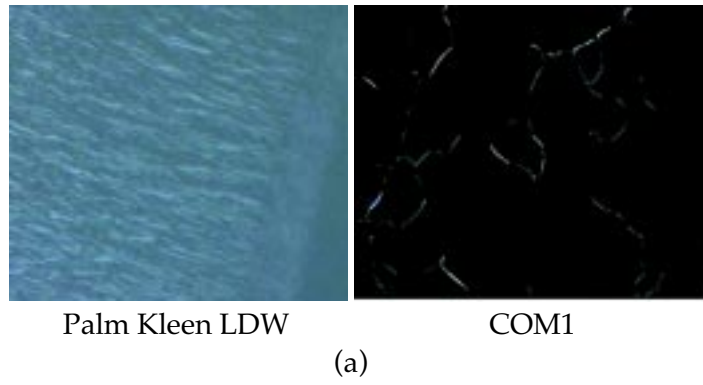


Figure 3. Liquid crystalline structure in the Palm Kleen liquid detergents and commercial samples (a) Palm Kleen LDW, (b) Palm Kleen GDW (c) Palm Kleen HS.

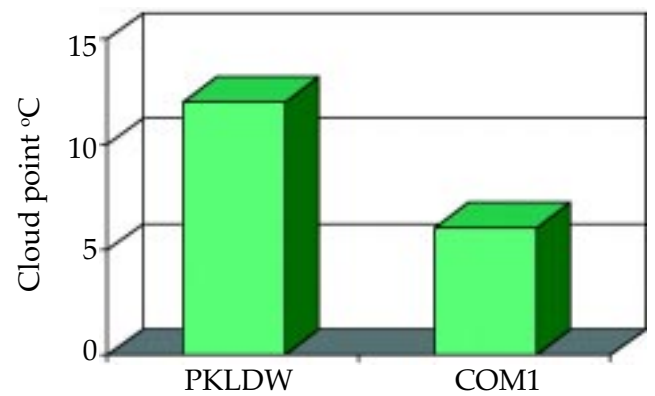
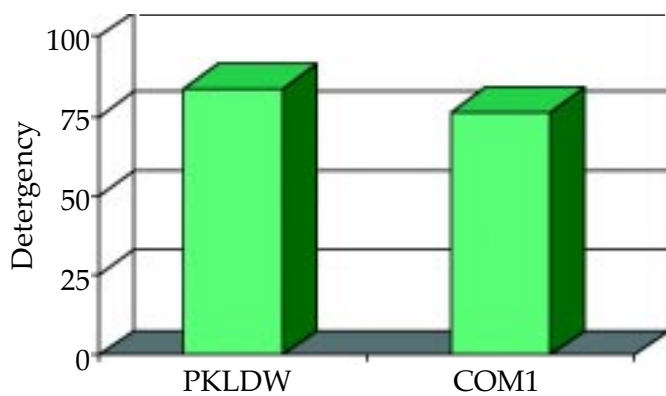


Figure 4. Palm Kleen LDW versus COM1.

TABLE 1. DERMAL IRRITATION ASSAY TEST PALM KLEEN DETERGENTS AND COMMERCIAL SAMPLES

Sample description	Predicted dermal irritancy classification
PKLDS	Non-irritant
PKGWD	Non-irritant
PKHW	Non-irritant
COM1	Non-irritant
COM2	Irritant
COM3	Non-irritant
COM4	Non-irritant

more viscous than COM1. Palm Kleen GDW produced same foam height/stability as COM2 but the pH and viscosity are quite different (Figure 5).

PALM KLEEN HAND WASH

Figure 6 shows that the detergency of Palm Kleen HS is comparable to COM3 and COM4. Figure 7 shows the cloud point of the Palm Kleen HS is a bit higher than commercial samples.

The pH of the Palm Kleen HW and commercial samples are in the range of 6.10 to 7.45 (Table 3). The foam height/stability of the Palm Kleen is comparable to the commercial samples. Palm Kleen is more viscous than commercial samples.

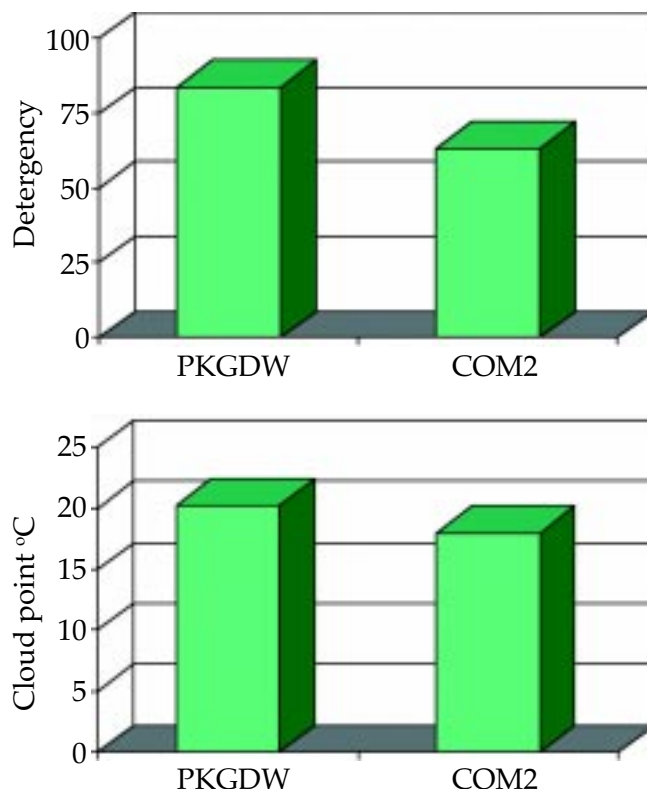


Figure 5. Palm Kleen GDW versus COM2.

ADVANTAGES OF PALM KLEEN DETERGENTS

- Palm Kleen LDW, Palm Kleen DW, Palm Kleen HW were developed using palm-based sulphonates methyl ester (SME) and fatty alcohol ether sulphates;

TABLE 2. PALM KLEEN LIQUID AND GEL DISH WASH VERSUS COMMERCIAL SAMPLES (COM1 and COM2)

Parameters	Palm Kleen LDW	COM1	Palm kleen GDW	COM2
pH	7.00	7.77	7.45	5.06
Foam height/stability	440/240	440/240	440/240	440/240
Viscosity (spindle TF 60 rpm)	10 498 cp	4 876 cp	109 300 cp	>200 000 cp

TABLE 3. PALM KLEEN HW ENRICHED WITH FRUITY FLAVOUR VERSUS COMMERCIAL SAMPLES

	Palm Kleen HW				
	Lemon	Citrus	Strawberry	COM3	COM4
pH	7.45	7.20	7.18	6.70	6.10
Foam height/stability	440/240	440/220	440/220	440/220	440/220
Viscosity (spindle TF 60 rpm)	10 680 cp	10 700 cp	10 651 cp	5 358 cp	4 952 cp

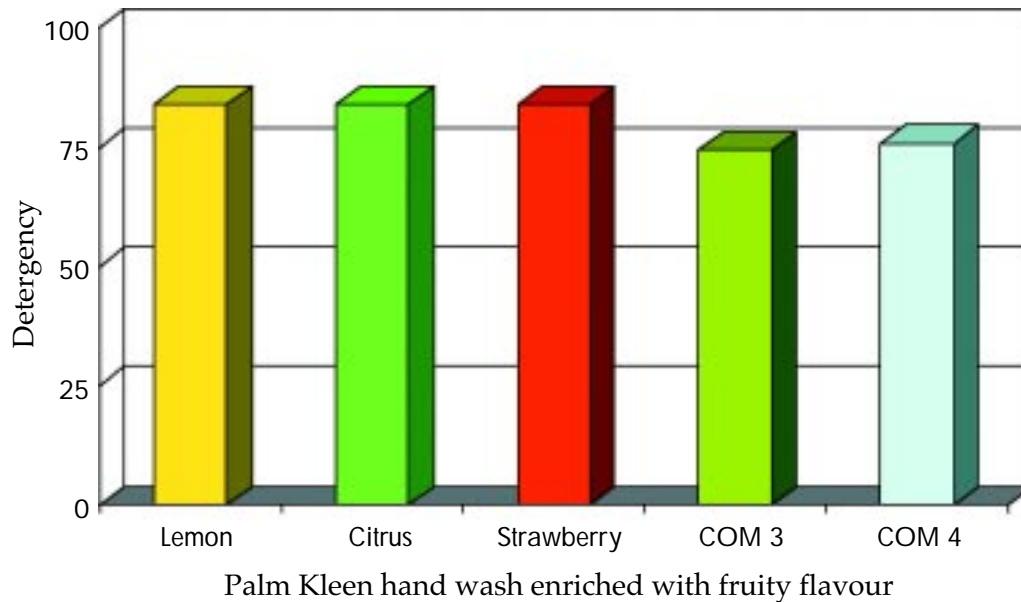


Figure 6. Detergency of Palm Kleen HW versus commercial samples.

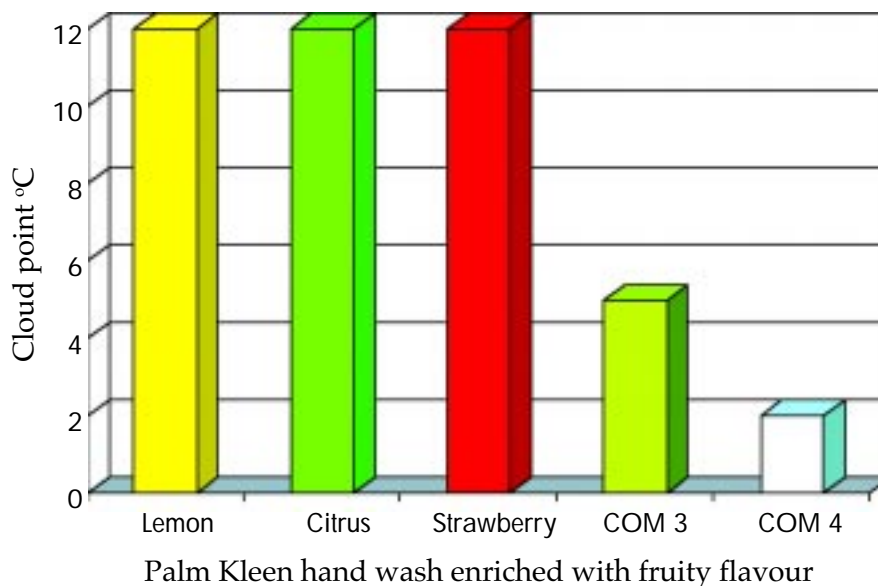


Figure 7. Cloud point of Palm Kleen HW versus commercial samples.

- The products showed better detergency as compared to commercial samples even though less active have been used;
- Other properties such as foaming power / stability, pH, viscosity, the Palm Kleen products are more or less the same as commercial samples;
- Palm Kleen products have higher cloud points because of the active SME was derived from C16-C18 acids;
- The price of SME is cheaper than LAS; and
- Dermal irritation assay tests confirmed that the Palm Kleen detergents are non-irritants to the skin.

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