

Physical and sensory characteristics of soaps obtained using red hot pepper seeds oil (*Capsicum annuum* L.)

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GOAL OF THE STUDY

Sensory profile of cosmetic products, including soaps, is essential to consumer perception. Therefore, soap manufacturers, using new and alternative raw materials, strive to improve the appearance of soaps, their consistency, their ability to foam, the feeling of cleanliness, the feeling on the skin after use, etc. The aim of this research is to determine the quality and sensory characteristics of soaps obtained with hot pepper seeds oil (*Capsicum annuum* L.) – an alternative raw material from waste plant products.

METHODOLOGY OF THE INVESTIGATION

Four variants/samples of soap (№1-4) with palm oil (PO), coconut oil (CO) and hot pepper seeds oil (HPO) were prepared in different proportions.

Sensory characteristics - Consumer tests with soaps have been performed. Assessors evaluate the indicators - surface type, color, resistance to erosion, foaming, hardness and general perception after the use of soap bars.

Surface tension - The maximum pressure P_{max} were determined that must be applied to blow the air bubble from the end of the capillary. In this method, the air bubble moves at a constant speed through the capillary which is immersed in the test solution. The pressure is created with the help of a water manometer.

Hardness and stickiness of the Texture Analyzer device - To investigate the texture parameters, a penetration experiment was performed by cylinder ($\varnothing = 5$ mm, speed of the deformation was 1 mm/s and maximum deformation was 5 mm).

MAIN RESULTS FROM THE STUDY

The conclusion of the sensory analysis shows that consumers give the highest overall perception rating to samples № 3 and № 4 – 4.3. The sensor profile is presented in Fig. 1.

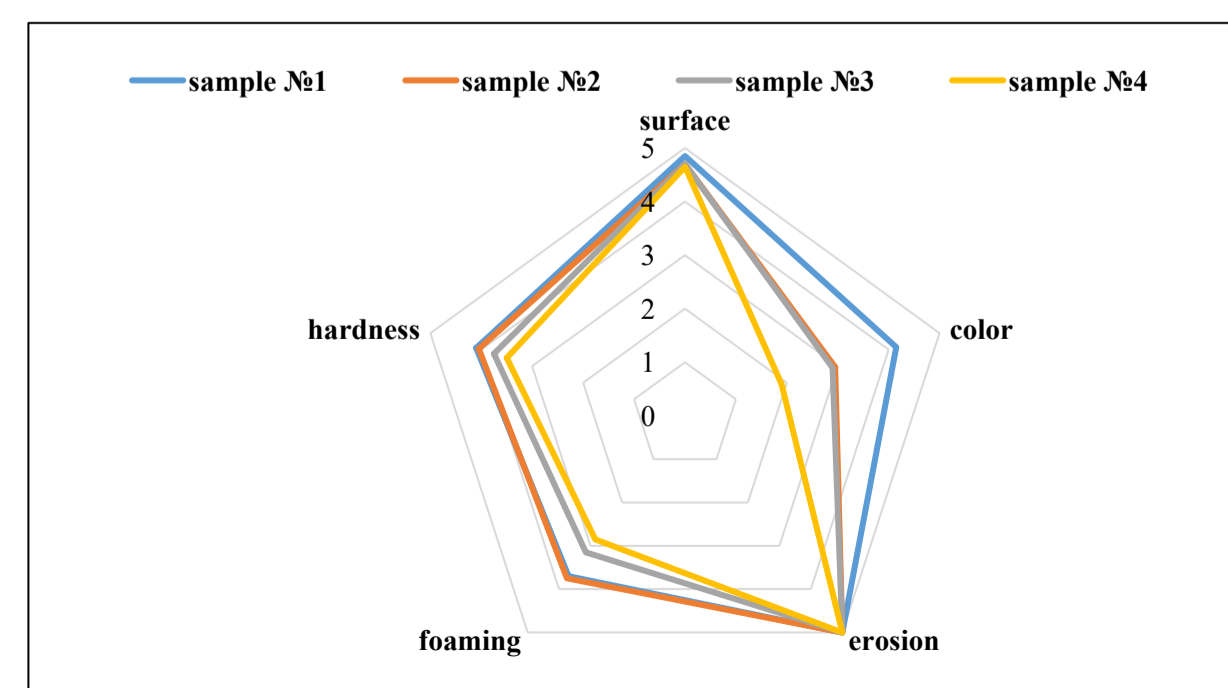


Fig. 1. Sensory analysis

Soap solutions of samples № 2, № 3 and № 4 have higher surface tension than that of the control sample, respectively – 61.268, 55.504 and 49.692 mN/m. The results show that the surface tension of the soap solutions significantly decreases with increasing percentage of HPO in the soap, but the values are not lower than those of the control sample № 1. The indicators hardness, modulus of deformation, deformation work, adhesion force and stickiness were also studied for the soap samples. The corresponding results are given in Table 4. Soap samples from № 1 to № 4 correspond to markings sN_1 to sN_4 in Table 1. and the diagrams in Fig. 2.

Table 1. Hardness of soaps

Soap sample	Hardness (N)	Modulus of deformation 2 (N/mm)	Deformation work (N.mm)	Adhesion force (N)	Stickiness (N.mm)	Hardness2 (N)
	avg±std	avg±std	avg±std	avg±std	avg±std	avg±std
sN_1	134.187±1.908d	132.153±15.482d	70.756±4.717de	-4.167±0.610bc	-5.228±0.117c	Is not available
sN_2	15.714 ± 1.499c	10.640 ± 1.490a	10.718 ± 1.435b	-3.556 ± 0.455b	-1.401 ± 0.194b	Is not available
sN_3	13.103 ± 0.932b	16.087 ± 2.619b	4.273 ± 0.763a	-1.986 ± 0.296a	-0.394 ± 0.045a	Is not available
sN_4	9.370 ± 0.574a	11.614 ± 1.020a	3.675 ± 0.441a	-3.259 ± 0.539b	-1.871 ± 0.250c	9.972 ± 0.687a

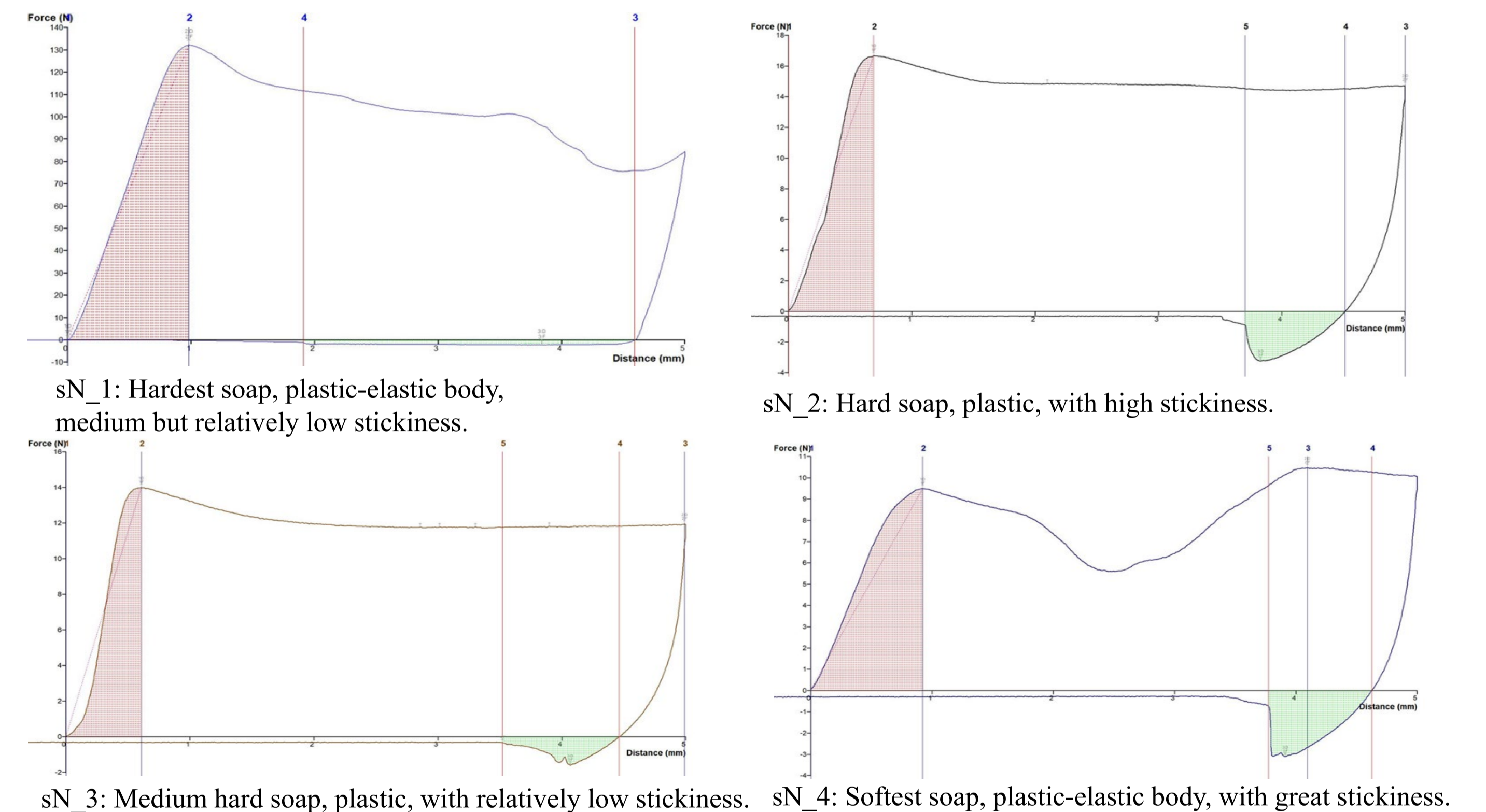


Fig. 2. Hardness diagram of soap samples sN_1 to sN_4.

CONCLUSIONS

The results of the sensory evaluation conducted after application of the product show that the appearance of soaps with HPO meets the requirements for this category of cosmetic products. After using it, the feeling on it is most acceptable, thanks to the participation of HPO. Adding more than 10 % of HPO to the oil mixture has a negative impact on the quality characteristics of the soap – hardness and resistance to use. The conclusions of the conducted study coincide with the results obtained from the study of the chemical parameters of the same soap samples. The results prove that HPO can be used in the production of cold process soaps, but in a limited amount up to 10 %.