TABLE 1

DIACYL PIPERAZINES AND PIPERAZONIUM SALTS

Compound	Formula	Mp (uncorr.)	Nitrogen, %		Remarks
			Calcd	Found	
Piperazines					No taste; water-insoluble
Di-β-cinnamenyl acrylyl	$C_{26}H_{26}O_2N_2$	209–9.5°	7.04	7.08*	
Di-5-phenyl-2-pentenoyl	$C_{26}H_{30}O_2N_2$	150–1°	6.97	6.73*	Decompn on vac distn
Di-5-phenyl-3-pentenoyl	$C_{26}H_{30}O_2N_2$	Oil	6.97	5.67*	
Di-5-phenyl-*n*-valeroyl	$C_{26}H_{34}O_2N_2$	64.5–65°	6.89	7.15*	
Piperazonium Salts					Pungent taste; water-soluble
Di-β-cinnamenyl acrylyl	$C_{26}H_{30}O_4N_2$	196–7°	6.45	6.32; 6.35†	
Di-5-phenyl-2-pentenoyl	$C_{26}H_{34}O_4N_2$	152–3°	6.39	6.31; 6.27†	
Di-5-phenyl-3-pentenoyl	$C_{26}H_{34}O_4N_2$	126.7°	6.39	6.56; 6.64†	
Di-5-phenyl-*n*-valeroyl	$C_{26}H_{38}O_4N_2$	119.5°	6.31	6.44*	

* Analyses by Samuel P. Sadtler & Son, Philadelphia, Pa.
† Analyses by Micro-Tech Laboratories, Skokie, Ill.

pounds were then purified by recrystallization from appropriate solvents.

Table 1 gives some of the properties of the compounds prepared. The melting points of the piperazonium salts are not reliable values for determining their purity, as the salts split off water on heating to form diacyl piperazines. None of the diacyl piperazines has the pungent taste of pepper, whereas all the corresponding diacyl piperazonium salts have this characteristic flavor to a marked degree.

References

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A High-Pressure Cytolyzer

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In recent experiments at this laboratory concerned with the removal of cholinesterase from insect tissue, it was found that the usual instruments used for homogenizing tissue were unwieldy for large amounts of materials. The Potter-Elvehjem homogenizer and the Waring Blendor, for example, either did not break down the cellular structure so that the enzyme could be thoroughly extracted, or they inactivated the enzyme by production of heat. It was found that this could be avoided in the following manner: The tissue was subjected to a high pressure (1,800 psi) of nitrogen and was allowed to equilibrate with this pressure for 24 hr, after which time the pressure was released instantly with a "quick-release" valve. This had the effect of exploding the cells, and practically 100% cytolysis occurred.

The apparatus (Fig. 1) was constructed at very little cost from a small gas cylinder rated at 3,000 psi and therefore safe for this purpose. It was cut in the middle, and 1½" steel sleeves with threads were roll-welded to the tank. This gave access to the chamber for placement and removal of the sample. The quick-release valve was a steam safety valve. The remaining portions of the apparatus were procured from surplus plumbing supplies, with the exception of a fitting for a 2,000 psi nitrogen cylinder.

This apparatus was tested on rat liver and brain, whole flies, and mold mycelium. It was successful in homogenizing the rat liver and brain, and the whole flies; the mold mycelium did not seem to be affected by the pressures. This type of apparatus can be used to homogenize large amounts of tissue; and cytolysis, at the time of pressure release, is done in extreme cold rather than heat, because of the drop in temperature when the pressure is released. For any experiments involving reproducible preparation of tissue breis or the removal of a biologically active material without heat inactivation, this method is very effective.

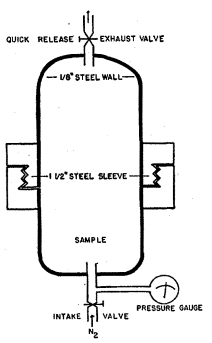

FIG. 1.

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