The Raman Effect of Fused Inorganic Nitrates.

THE Raman Effect of inorganic nitrates in solution and as powdered crystals has been studied by a number of investigators and the normal vibration frequencies of the NO_3 ion, theoretically calculable from a plane equilateral triangular model, are known to be present in the scattered spectrum of these compounds. It is also well known that these free ionic frequencies are modified to a certain extent by the physical state in which the substance is studied. For example, in crystals these frequencies have higher values than in solutions. It will be interesting to study how far the fused state of the substance affects these natural frequencies. With this purpose in view we have investigated a number of inorganic nitrates (whose melting points are below 600°C) in which the Raman spectra are obtained with the substance maintained in a molten condition in a specially constructed electrical furnace. The full report of the investigation is in course of publication and we give below the results obtained with sodium and potassium nitrates only.

	Solution	Crystal	Fused salt
$NaNO_3$	725 1048 1361	720 1066 1383	715 1054 1393
KNO_3	730 1049 1357	711 1051 1350	721 1052 1343

In sodium nitrate so far as the inactive frequency at 9·5 μ is concerned the fused state occupies an intermediate position between the crystal and the solution while in potassium nitrate this oscillation is apparently uninfluenced by the physical state. This independence of the inactive frequency upon the physical state becomes more and more apparent as the weight of the metallic radical increases. Thus the greatest discrepancy is shown only in lithium and in sodium. With regard to the active frequencies there does not seem to be any systematic variation. The very short shifts observed in crystals and associated with the lattice structure are not obtained in the fused salts.

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