

I am indebted to the Natural History Museum for the identification of the species from specimens submitted. The batches were all obtained from blackfaced sheep in long wool; the strikes occurred on various parts of the body, for example, the throat, loins, tailhead, breech, etc. Each batch yielded anything from a dozen or so to more than three hundred individuals.

It would appear, therefore, that in western Scotland at least, this species acts as a primary blowfly, initiating strike on relatively clean-woolled areas.

The closely related species, *Phormia regina*, is the principal sheep blowfly of North America, but *Phormia terre-novae* has not been recorded previously, from any country, as attacking sheep. In view of its wide European and North American distribution, and of the newly emerged fact that it is able to strike sheep, the absence of any such records is a matter of considerable interest.

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¹ MacDougall, R. S., *Trans. Highl. Agric. Soc. Scot.*, 21, 135 (1909).

² Davies, W. Maldwyn, *Ann. App. Biol.*, 21, 267 (1934).

³ Ratcliffe, F. N., *Ann. App. Biol.*, 22, 742 (1935).

Temperature Coefficient of the Electrolytic Separation of the Hydrogen Isotopes

In the course of an experimental study of the electrolytic separation of the isotopes of hydrogen at current densities of one milliamp./cm.² and less with rigorous exclusion of oxygen, grease and other contamination, we have measured the temperature variation of the separation at mercury and silver cathodes with somewhat unexpected results.

The electrolyte was 0.5*N* hydrogen chloride (with 0.5*N* potassium chloride added in the experiments with mercury), and the anode consisted of the same metal as the cathode. The deuterium content of the cathode gas was determined by the micro-thermal conductivity method of Farkas¹. The following values for the electrolytic separation coefficient (α) were obtained at 15° C. and 98° C.:

Cathode	15° C.		98°	98° (calc.)
	(i)	(ii)		
Mercury	2.8	3.35	3.25	2.3
	3.1	3.25	2.95	2.5
Silver	7.0	6.5	4.6	4.6
	7.0	6.6	4.4	4.6

The two columns for the lower temperature relate to measurements made respectively before and after the high temperature measurements. The last column gives the separation factor that would be expected at 98° C. from the relation

$$\ln \alpha = \frac{\Delta E}{RT}$$

where ΔE is the difference in activation energy necessary to account for the separation factor (i) at 15° C. The probable error in the values of α is 2-3 per cent. The anomalous behaviour of mercury is remarkable, but might perhaps be accounted for by assuming that both of the alternative mechanisms ('catalytic' and 'electrochemical') of Horiuti and Okamoto² contributed to

the cationic discharge, and that at the higher temperature the relative participation of the two mechanisms became more nearly equal.

With the view of testing this possibility, small quantities of α -naphthoquinoline, which might be expected to inhibit the 'catalytic' mechanism, were added to the electrolyte with the following results:

Cathode	Concentration of inhibitor	15°		98°
		(i)	(ii)	
Mercury	2 millimols/litre	1.25	1.4	1.7
	0.3 " "	1.55	1.55	2.2
Silver	0.3 " "	1.7	3.0 falling to 2.3	3.7

The results for mercury, which incidentally show the lowest separation yet recorded, do not seem to fit in with the provisional hypothesis outlined above. The possibility that isotopic discrimination in cathodic reduction of the catalytic poison would account for the anomalous temperature variation seems to be excluded by the duration of the electrolysis.

The experiments are being continued and their possible interpretation will be discussed in detail elsewhere.

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¹ A. and L. Farkas, *Proc. Roy. Soc. A*, 144, 467 (1934).

² Horiuti and Okamoto, *Sci. Papers Inst. Phys. Chem. Research, Tokyo*, 28, 231 (1936); *Brit. Chem. Abstracts*, 430 (1936)

Raman Spectrum of Thiophosphoryl Chloride

THE Raman spectrum of phosphorus oxychloride has been explained by assuming an asymmetric tetrahedral structure for its molecules. The molecules of thiophosphoryl chloride may, by analogy with those of the oxychloride, be supposed to have a similar tetrahedral structure; and the Raman spectra of these two compounds should then be similar.

The following table gives the prominent shifts that I have observed in the Raman spectrum of thiophosphoryl chloride:

	PSCl ₂	POCl ₃ ¹
A	171 cm. ⁻¹	192.85 cm. ⁻¹
B ₁	246 "	267.39 "
B ₂	382 "	337.44 "
C	432 "	486.24 "
D ₁	543 "	581.2 "
D ₂	750 "	1289.9 "

The data for the oxychloride are taken from Langseth's work¹. The slight reduction in the values of the Raman shifts in thiophosphoryl chloride is presumably due to the substitution of the oxygen atom in the oxychloride by an atom of sulphur.



FIG. 1. Raman spectra of thiophosphoryl chloride (PSCl₂).

The shift $\Delta\nu = 1,290$ has been assigned to the P—O bond in the oxychloride²; the shift $\Delta\nu = 750$