$(CO_3/OH)_R$	$(CO_3/OH)_S$	Total conc.
1·37	0·062	0·0976
2·16	0·095	0·04912
3·82	0·167	0·0196

The first two columns give the carbonate – hydroxide ratios at equilibrium, in the resin and in the corresponding solution, measured in equivalents, and the third the total concentration of the solution in gram-equivalents per litre.

An efficient chromatographic separation of carbonate and hydroxide is clearly possible, and offers a very simple method of preparing the carbonate-free alkali continually needed for volumetric work and in the preparation of buffer solutions. Rather more than the required amount of alkali is made up, without special precautions, from washed sticks, and a column of the resin, which may be initially in the form of its chloride, is prepared in the usual way. The capacity of the air-dry resin is 1·4 milli-equivalents per gram, and a 50-ml. tube two-thirds full of the resin would be suitable for preparing 1 litre of 0·1 *N* sodium hydroxide. The alkali is passed through the resin until the effluent is chloride-free (if necessary), and the tube is then transferred to the neck of the stock bottle. When the rest of the alkali has passed through, the resin column is replaced by a sodalime guard tube, and the carbonate-free sodium hydroxide is ready for standardization.

The direct replacement of carbonate in the exhausted resin by hydroxide is difficult, but the column can be easily regenerated by the passage of hydrochloric acid, which destroys the carbonate, and the subsequent replacement, as described, of the chloride by hydroxide.

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Recrystallization of Regenerated Cellulose upon Mercerization

In a recent paper[1], it was shown by application of a quantitative X-ray method[2] that viscose rayon fibres, upon boiling with 2·5 *N* sulphuric acid, exhibit a distinct increase in crystallinity from 40 per cent initially to nearly 50 per cent, which is terminated within half an hour. The decrease of water sorption after the treatment was in line with this result.

It has now been found that a similar recrystallization can be effected by 'mercerization'. Four different rayon fibres were soaked in 18 per cent caustic soda solution at room temperature for 10 min., freed from lye by pressing between filter paper, and put into a large quantity of boiling water to remove the residual caustic soda. After rinsing with dilute acetic acid and then water, the fibres were dried in the air.

The loss in weight owing to the previous operations amounted to 3–6 per cent. Examination with X-rays (method of ref. 2) of four different rayon samples thus treated yielded a percentage crystallinity varying between 50 and 55 per cent (taking into account the small loss in weight), and thus an even somewhat larger increase than that obtained by acid hydrolysis.

The recrystallization upon acid hydrolysis has tentatively been explained as follows. Cutting of part of the chains in the amorphous regions of the irregular partly crystalline network structure in the cellulose gel may remove part of the entanglements, or restore some of the inhibited segmental freedom of movement and rotation which prevent further growth of the crystalline regions. It remains to be investigated whether the result of the mercerization experiments can or cannot be explained in a similar way.

Experiments repeated in an oxygen-free atmosphere and thus excluding chemical degradation will be required in this connexion. Further work along this and other lines is in progress.

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[1] Hermans, P. H., and Weidinger, A., *J. Polymer Sci.*, **4**, 317 (1949).
[2] Hermans, P. H., and Weidinger, A., *J. App. Phys.*, **19**, 491 (1948); *J. Polymer Sci.*, **4**, 135 (1949).

Electric Potential of Solutions as a Cause of the Formation of Liesegang Rings

Following our experiments in relation to the influence of electric current on the formation of Liesegang rings, it has been found that silver nitrate (diluted) drops on chromogelatine cause a potential difference of nearly 80 millivolts. The silver nitrate has a positive, and the chromogelatine a negative, potential. This potential difference lasts only so long as silver dichromate is being formed. At first it decreases very quickly, and at the same time with the quick appearance of the rings; later, the rate of decrease becomes slower, parallel with the slower formation of the rings. If the silver nitrate–chromogelatine pair is short-circuited (by short-circuiting the electrodes), then a change is observed in the appearance of the Liesegang rings; normal rings are shown in Fig. 1 and modified rings in Figs. 2 and 3.

The short-circuit causes a much more rapid decrease of the potential difference, although it still lasts more than fifty hours. Therefore, we have tried