

## **Hydration of Poly(Acrylic Acid) Lithium Salts**

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### Summary

Drying and water uptake of poly(acrylic acid) lithium salts with different degrees of neutralization were studied. Though the equilibrium water uptake increased with increasing neutralization %, the slope of the plot above ca. 33 % neutralization was greater than that below this neutralization %.

### Introduction

The preceding papers in this series (HIRAOKA and YOKOYAMA 1980 a and b) have shown the drying process and equilibrium water uptake of poly(acrylic acid) sodium salts (PANa) and potassium salts (PAK). In the present paper we wish to call further attention to the hydration behavior of poly(acrylic acid) lithium salts (PALi).

### Experimental

The experiments for PALi were carried out according to the procedure described before (HIRAOKA and YOKOYAMA 1980 a and b).

### Results and Discussion

#### Drying process

Drying process of PALi are very similar to those of PANa and PAK (HIRAOKA and YOKOYAMA 1980 a and b). The previous idea that the drying process of PAA salts is not governed by  $T_g$  (diffusion-controlled) but is governed by the release of water molecule from hydrated state (dehydration-controlled) was confirmed by this study.

#### Water uptake

Fig. 1 shows the equilibrium water uptake as a

function of the degree of neutralization. It appears that the slope of the plot increased above ca. 33 % neutralization as in the case of PANa. This increase may be interpreted in the same way as that for PANa.

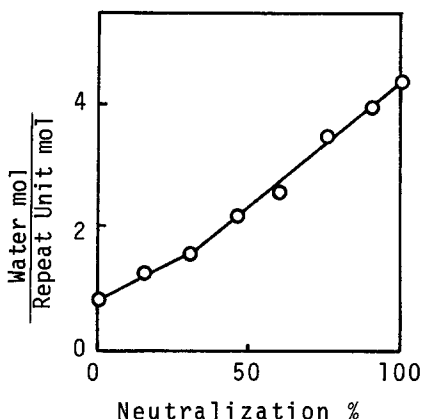


Fig. 1 Equilibrium water uptake at 25°C and 73 % relative humidity for poly(acrylic acid) lithium salts with different degrees of neutralization.

The slope of the plot in the low neutralization range differs among the ion species. For PAK the slope in problem was negative, whereas it was positive for PANa and PALi. The slope for PALi is much greater than that for PANa as expected before (HIRAOKA and YOKOYAMA 1980 b). The detail of the discussion on this slope has been described in the preceding paper (HIRAOKA and YOKOYAMA 1980 b).

#### References

- HIRAOKA, K and YOKOYAMA, T. : Polym. Bull., 2, 183 (1980 a)  
 HIRAOKA, K., GOTANDA, M., and YOKOYAMA, T.: Polym. Bull., 2, 631 (1980)

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