RADIOCARBON DATING OF TEXTILES

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During the last ten years successful radiocarbon dating of textile fibres has been conducted with negligible damage to the artefact. With the Accelerator Mass Spectrometry technique only a few millimetres of thread, corresponding to an equivalent weight of some mg carbon, is enough for an analysis.

Different pretreatment schemes have been applied to clean the fibres from different types of "dirt", depending on the material (wool, linen, silk) and how the material has been stored. Archaeologically excavated objects affected by the soil have to be cleaned from carbonates and humics by standard acid-alkali-acid pretreatment. In the case of wool even a very weak alkali (0,5% NaOH, at RT) wash will, however, completely dissolve the fibre. Our experience is in concordance with published data (Taylor et al 1995) that show the keratin as relatively resistant against chemical diagenetic processes which means that infiltration of e.g. humics is of less importance.

We inspect the sample in a microscope before and after the cleaning procedure to control the quality and to recognise the colour and fiber structure. Normal pretreatment consists of $CHCl_3$, CH_3OH, C_2H_5OH, HCl (1%) and washing/rinsing in distilled water.

A large number of objects from iron age peat bog finds to medieval church textiles have been analysed in the Uppsala AMS laboratory. Several examples including the Bocksten peat bog man, the Över-Hogdal tapestry and the Golden Gown of Queen Margareta in the Uppsala Cathedral will be presented.

References

Taylor, R.E., Hare, P.E., Prior, C.A., Kirner, L., Wan, L. and Burky, R.R. 1995. Radiocarbon dating of biochemically characterized hair. Radiocarbon 37, No. 2, pp. 319–330.