Alum-treated wood – Material characterization. A case study of the Oseberg finds

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Alum-treated archaeological woods from the Oseberg collection, excavated and treated in the early 1900s demonstrate an extreme deterioration, only discovered in the past decade or so. Parts of this unique collection may be visited at the Viking Ship Museum in Oslo, Norway. It represents one of the most comprehensive collections of Viking Age wooden objects in the world; the spectacular surface carvings are a signature of these finds. The alum-treatment was a common method of conserving highly degraded archaeological wood in the period spanning 1860 to the late 1950s, after which it was replaced by other treatments using for example polyethylene glycol. Alum, or potassium aluminum dodecahydrate has the formula KAl(SO₄)₂·12H₂O.

Scientific investigations are currently underway in the research project Saving Oseberg, which aim is to develop strategies for the future preservation of these objects. Research undertaken in this thesis was carried out within the framework of Saving Oseberg and its predecessor, the Alum Research Project.

Research was aimed at understanding the characteristics of the naturally aged material through chemical analyses, morphological studies, and moisture adsorption. Experiments related to understanding the alum-treatment itself were also organized, and investigated the source of acidity as well as the state of chemical preservation immediately after treatment. Aging studies of fresh and archaeological woods treated in the laboratory monitored chemical and colour changes. Retreatment trials on a small number of alum-treated fragments from the Oseberg find gave insight into critical steps that will be necessary to consider in future retreatment design.