SUMMARY

In the year 2020 in Estonia, approximately 6.4 million tons of oil shale got burned for power and energy generation. The ashes are mainly deposited on land fields, and only a small amount is utilized. Also, the combustion of oil shale generates CO_2 emissions which is the main precursor of climate change. Hence, measures must be taken to reduce the pollution caused by oil shale industry.

In this thesis work, oil shale ash from Auvere power plant was used to produce precipitated calcium carbonate. This was seen as a viable means of reducing oil shale ash deposition on ash fields as well as CO2 emissions into atmosphere as they can be channeled into making useful industrial products.

Model simulation using Aspen Plus platform was also used to predict the dissolution behavior in the solid and liquid phases, and these were compared with the experimental results obtained.

The thesis focused on producing high-quality PCC under some operating conditions and it was observed that there is still room for further studies to improve the leaching, carbonation, and model simulation for high grade PCC production viable for industrial usage.