

Catalyst Regeneration of RAP-Binder in Asphalt Dataset

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(This dataset supports report **Catalyst Regeneration of RAP-Binder in Asphalt**, <https://doi.org/10.5281/zenodo.6465408>).

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The related final report **Catalyst Regeneration of RAP-Binder in Asphalt**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/61734>.

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Abstract: Reclaimed Asphalt Pavement (RAP) binders are difficult to reuse because they often contain associated/aggregated molecules with very high molecular weights. This is due to the polarity gained during oxidative aging, causing the aggregation to occur. These high molecular weight components are responsible for RAP binder's increased viscosity and certain deteriorated rheological properties. One strategy to reuse RAP binder is to mix it with virgin asphalt binder and use this partially recycled mixture in asphalt. The RAP binder is usually improved before mixing by the addition of rejuvenators, softening agents, softer binders, and antioxidants to the asphalt binder mix to rebalance their rheological properties. The purpose of this research was to study effective ways to incorporate RAP content in asphalt mixtures using a novel approach of introducing a catalyst that can modify the binder's chemical composition; particularly to alter the oxidized molecules and reduce the number/content of aggregated structures. The use of a catalyst such as a Lewis acid to break the associated molecules in the RAP-binder is a new promising approach. The Lewis acids catalysts are known to catalyze the conversion of coal to liquid product, but the mechanism of action is not well understood. This report describes the result of our investigation into the effects of a Lewis acid catalyst such as Iron (III) chloride and Zinc chloride on the chemical composition of RAP-binder. The ultimate result is that Iron (III) chloride lowers the size of high molecular weight material when 2% w/w is used with RAP at 165 degrees Celsius for 30 minutes.

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Recommended citation:

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Dataset description:

This dataset contains 1 file described below.

Spivak_Excel_data_sheet.xlsx:

The .xlsx and .xls file types are Microsoft Excel files, which can be opened with Excel, and other free available software, such as OpenRefine.

National Transportation Library (NTL) Curation Note:

As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (<https://ntl.bts.gov/public-access>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at https://digitalcommons.lsu.edu/transet_data/108/ on 2022-05-20. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.