

## **HR-298 Correlation of Locally Based Performance of Asphalts with their Physico-Chemistry**

**Key Words:** Physico Chemistry, Asphalt Testing, Asphalt Performance

### **ABSTRACT**

Highway Research Project HR-298 was undertaken to study the relationships between the performance of locally available asphalts and their physicochemical properties under Iowa conditions with the ultimate objective of development of a locally and performance-based asphalt specification for durable pavements.

Physical and physicochemical tests were performed on three sets of asphalt samples including: (a) twelve samples from local asphalt suppliers and their TFOT residues, (b) six core samples of known service records, and (c) a total of 79 asphalts from 10 pavement projects including original, lab aged and recovered asphalts from field mixes, as well as from lab aged mixes. Tests included standard rheological tests, HP-GPC and TMA. Some specific viscoelastic tests (at +50°C) were performed on (b) samples and on some (a) samples. DSC and X-ray diffraction studies were performed on (a) and (b) samples. Furthermore, NMR techniques were applied to some (a), (b) and (c) samples.

Efforts were made to identify physicochemical properties which are correlated to physical properties known to affect field performance. The significant physicochemical parameters were used as a basis for an improved performance-based trial specification for Iowa to ensure more durable pavements.