

ENGINEERING

Chair: CHARLES W. LOVELL
School of Civil Engineering
Purdue University
West Lafayette, Indiana 47907

Chair Elect: DAVID CHESAK
Department of Physics
St. Joseph's College
Rensselaer, Indiana 47978

ABSTRACTS

Toward the Formation of Electrical Contacts on Single Crystal Cubic Silicon Carbide. J. J. BELLINA, JR., Saint Mary's College, Department of Chemistry and Physics, Notre Dame, Indiana 46556.—Cubic Silicon Carbide (3C SiC) has potential as a high temperature semiconducting material for advanced sensors, electrical power control in space vehicles, and future generation computers. Device quality single-crystal epitaxial films of 3C SiC have recently been grown by chemical vapor deposition on Si substrates. The technology for controlling both the bulk and the surface properties of this new material is currently in development. Research on the surface characteristics of 3C SiC will be described. The results reveal how the surface responds to heating in vacuum, in hydrogen, and in an oxidizing environment, and to ion damage, and to metal deposition.

MIDI: Musical Instrument Digital Interface. DAVID D. CHESAK, St. Joseph's College, Rensselaer, Indiana 47978.—The MIDI specifications for hardware standards and software protocols for communication between electronic musical instruments were established about five years ago by joint agreement among the major manufacturers of these products. This paper presents an interface circuit and computer programs for data exchange between a microcomputer and a music synthesizer utilizing the MIDI specifications.

Chemical and Physical Characterization of Indiana Bottom Ashes. W. H. HUANG and C. W. LOVELL, School of Civil Engineering, Purdue University, West Lafayette, Indiana 47907.—A byproduct of coal-fired power production in Indiana is an enormous volume of bottom ash, and the power companies spend a considerable sum in waste-disposal of it. The Federal Highway Administration and the Indiana Department of Highways are currently engaged in a study to determine potential uses of these ashes in Indiana highway construction. This usage depends upon both the chemical and physical behavior of the materials. The paper describes what has been learned to date about selected Indiana ashes.

The Sources of Indiana Coal Ash: Road Building Materials? ROBERT RAHN, Indiana Department of Highways, 120 South Shortridge Drive, Indianapolis, Indiana 46219 and C.W. LOVELL, School of Civil Engineering, Purdue University, West Lafayette, Indiana 47907.—Enormous quantities of coal ash are produced in Indiana as waste from power generating facilities. Both the finer constituents (fly ash) and the coarser (bottom ash) have had limited usage in the construction of Indiana highways. However, there is a substantial motivation to increase such

usage, particularly for the bottom ash. At least some of this material seems suitable for incorporation in highway embankments, subgrades, and subbases. One step in further investigating the suitability of these ashes has involved detailed study of the way selected power companies store their wastes. Some storage practices are found to be much more conducive to the economic retrieval and utilization of the ashes than others. The practices are illustrated by a videotape recently produced by the Indiana Department of Highways.