**Effect of Exfoliation on the Electrical and Mechanical Behavior of Intercalated Graphite.** B.D.L. CHUNG, Carnegie-Mellon U. --Exfoliation was found to decrease the electrical resistivity of bromine-intercalated graphite (HOPG) along the c-axis by a factor of about 0.05 and to increase that along the a-axis by a factor of about 200. The reversible change in the c-axis electrical resistance at the exfoliation temperature due to reversible exfoliation allows thermally activated electrical switching. Exfoliation of graphite fibers increases the ductility of the graphite fibers. Applications of exfoliated graphite will be summarized.

**Electronic structure of KBrCoCl.** R. J. Brown* and W. A. W. Holzwarth, Wake Forest U. --Using self-consistent local density theory with mixed basis pseudopotential techniques, we have studied the electronic structure of the ternary graphite intercalation compound KBrCoCl. In order to reduce the computation to a manageable size, we slightly simplified the known crystal structure to one having 12 atoms per unit cell, maintaining the full intralayer geometry and the nearest neighbor interlayer geometry of the correct structure. We also assumed the Hg hexagonal layers to be planar, the kagome of the Hg layers to be planar, the graphite layers to be planar, the Fermi surface, indicating the presence of several types of charge carriers.

 supported by AFOSR Contract F49620-82-C-0011.

**Electrochemical properties of Stage-3 FeCl3•IGC.** A. IBRAHIM, G.O. ZIXMERMAN, K. GALUSZEWSKI, MIT. -- The tempretature and magnetic field dependence of the magnetic susceptibility, magnetisation and conductivity of FeCl3•IGC have been measured using various techniques. The results of the temperature dependence measurements show two phase transitions occurring at Te and Th. Below Te, the results show that the system is in a 3D phase, the spins coupled ferromagnetically inplane and antiferromagnetically interplane. A Kosterlitz-Thouless type phase transition for finite size systems occurs at Th. The system is in a 2D-XY vortex bound phase for Te < T < Th, and a 2D-XY vortex gas phase for T > Th. This is illustrated for CoCl3•IGC samples with stages 1, 2 and 3. The results of the magnetic field dependence measurements suggest the existence of three magnetic phases at low temperature (T < Te): 1) Antiferromagnetic phase for H < Hc1; 2) Spin-Flop phase for Hc1 < H < Hc2; 3) Ferromagnetic phase for H > Hc2. A magnetic phase diagram for this system is presented.

*Supported by AFOSR Contract F49620-83-C-0011.

**Preliminary Investigation of Crystalline Graphite by (e,2e) Spectroscopy.** J.R. DENNISON and A.L. RITTER, Virginia Polytechnic Institute and State University. The cross section for (e,2e) scattering provides a direct measure of the energy-momentum dispersion relation in solids, since it is proportional to the spectral momentum density (the probability of finding an electron in the system with a particular energy and momentum). The technique of (e,2e) spectroscopy is well established for investigating atomic and molecular systems, but has been applied less successfully to solids. A recent (e,2e) measurement of amorphous carbon demonstrated that sufficient energy and momentum resolution could be attained to observe the valence band structure in solids. An investigation of crystalline graphite has been undertaken to establish confidence in this new technique and to construct the spectral momentum densities of amorphous and graphitic carbon. Our results are compared to measurements of graphite band structure from angle-resolved photoemission.

* Submitted by A.L. RITTER.

**Preliminary Investigation of Crystalline Graphite by (e,2e) Spectroscopy.** J.R. DENNISON and A.L. RITTER, Virginia Polytechnic Institute and State University. The cross section for (e,2e) scattering provides a direct measure of the energy-momentum dispersion relation in solids, since it is proportional to the spectral momentum density (the probability of finding an electron in the system with a particular energy and momentum). The technique of (e,2e) spectroscopy is well established for investigating atomic and molecular systems, but has been applied less successfully to solids. A recent (e,2e) measurement of amorphous carbon demonstrated that sufficient energy and momentum resolution could be attained to observe the valence band structure in solids. An investigation of crystalline graphite has been undertaken to establish confidence in this new technique and to construct the spectral momentum densities of amorphous and graphitic carbon. Our results are compared to measurements of graphite band structure from angle-resolved photoemission.

* Submitted by A.L. RITTER.

**Preliminary Investigation of Crystalline Graphite by (e,2e) Spectroscopy.** J.R. DENNISON and A.L. RITTER, Virginia Polytechnic Institute and State University. The cross section for (e,2e) scattering provides a direct measure of the energy-momentum dispersion relation in solids, since it is proportional to the spectral momentum density (the probability of finding an electron in the system with a particular energy and momentum). The technique of (e,2e) spectroscopy is well established for investigating atomic and molecular systems, but has been applied less successfully to solids. A recent (e,2e) measurement of amorphous carbon demonstrated that sufficient energy and momentum resolution could be attained to observe the valence band structure in solids. An investigation of crystalline graphite has been undertaken to establish confidence in this new technique and to construct the spectral momentum densities of amorphous and graphitic carbon. Our results are compared to measurements of graphite band structure from angle-resolved photoemission.

* Submitted by A.L. RITTER.

**Preliminary Investigation of Crystalline Graphite by (e,2e) Spectroscopy.** J.R. DENNISON and A.L. RITTER, Virginia Polytechnic Institute and State University. The cross section for (e,2e) scattering provides a direct measure of the energy-momentum dispersion relation in solids, since it is proportional to the spectral momentum density (the probability of finding an electron in the system with a particular energy and momentum). The technique of (e,2e) spectroscopy is well established for investigating atomic and molecular systems, but has been applied less successfully to solids. A recent (e,2e) measurement of amorphous carbon demonstrated that sufficient energy and momentum resolution could be attained to observe the valence band structure in solids. An investigation of crystalline graphite has been undertaken to establish confidence in this new technique and to construct the spectral momentum densities of amorphous and graphitic carbon. Our results are compared to measurements of graphite band structure from angle-resolved photoemission.

* Submitted by A.L. RITTER.

**Preliminary Investigation of Crystalline Graphite by (e,2e) Spectroscopy.** J.R. DENNISON and A.L. RITTER, Virginia Polytechnic Institute and State University. The cross section for (e,2e) scattering provides a direct measure of the energy-momentum dispersion relation in solids, since it is proportional to the spectral momentum density (the probability of finding an electron in the system with a particular energy and momentum). The technique of (e,2e) spectroscopy is well established for investigating atomic and molecular systems, but has been applied less successfully to solids. A recent (e,2e) measurement of amorphous carbon demonstrated that sufficient energy and momentum resolution could be attained to observe the valence band structure in solids. An investigation of crystalline graphite has been undertaken to establish confidence in this new technique and to construct the spectral momentum densities of amorphous and graphitic carbon. Our results are compared to measurements of graphite band structure from angle-resolved photoemission.

* Submitted by A.L. RITTER.