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P-34	**Zhenjiang ZHANG** (Southeast University, Nanjing) "Electronic properties of armchair graphene nanoribbons with vacancies"
P-35	**Wenzhu OUYANG** (Technical Institute of Physics and Chemistry, CAS, Beijing) "Preparation and Applications of 3D Porous RGO/Cellulose Composites"
P-36	**Xie Hong** (Institute of Microsystem and information, CAS, Shanghai) "Large Scale Integration of CVD Graphene FET for Radio Frequency Application"
P-37	**Tao Ouyang** (Xiangtan University, Hunan) "The Thermal transport properties in graphene and its derived nanostructures"
P-38	**Donghui Guo** (University of Tsukuba, Japan) "Observation of Landau levels in partially potassium-intercalated graphite under a zero magnetic field"
P-39	**Seok Ryul Choi** (Sungkyunkwan University, Korea) "Flexible Thin-Film Schottky-Junction Photovoltaic Cell using Graphene Electrode"
P-40	**Dongli MENG** (Technical Institute of Physics and Chemistry, CAS, Beijing) "Preparation and properties of GO/P3HT composites via grafting P3HT brushes on GO sheets"
P-41	**Jinhua SUN** (Technical Institute of Physics and Chemistry, CAS, Beijing) "Multiple-Bilayered RGO/Porphyrin Films for Photoelectrochemical Cells"
P-42	**Chenfang Lin/ Fen Ke** (Peking University, Beijing) "Periodically modulated graphene prepared on high index surface Cu(410)-O"
P-43	**Yun Zhu** (Changzhou University, Changzhou/ Shanghai Institute of Microsystem and Information Technology, CAS, Shanghai) "Chemical vapor deposition of Graphene on liquid metal catalysts"
P-44	**Danil Boukhvalov** (School of Computational Sciences, Korea Institute for Advanced Study, Korea) "Formation of Defects in Graphene in the Presence of Adatoms: Theory and Experiment"
P-45	**Keke Mao** (University of Science and Technology of China, Hefei) "Potential Catalytic Application o CO Oxidation of V@h-BN supported Gold Cluster"
P-46	**Zegao WANG** (University of Electronic Science and Technology of China, Chengdu) "Effects of Hydrogen Flux on Domain Structures of Single Crystalline Graphene on Cu Foils"
P-47	**Xin HAO** (University of Electronic Science and Technology of China, Chengdu) "Oxygen-plasma thinning of graphene layer epitaxially grown on carbon-terminated SiC substrate"
P-48	**Jin Zhang** (Jiangsu University, Zhenjiang) "The Study of Reducing Gate Supply Voltage in Graphene Field-Effect Transistors with Thin Oxides"
P-49	**Seung-Jae Baeck** (Sungkyunkwan University, Korea) "Low temperature growth of graphene on patterned stamp for nanoimprinting"
P-50	**Long REN** (Xiangtan University, Hunan) "Upconversion-P25-graphene composite as an advanced sunlight driven photocatalytic hybrid material"
P-51	**K.B.Korzhynbayeva** (Al-Farabi Kazakh National University, Almaty) "Structure of Magnetic Clay of Bentonite"

Structure of Magnetic Clay of Bentonite

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By sequential deposition of Fe2+ and Fe3+ in the presence of ammonia and bentonite obtained magnetic clay. In the magnetic composite detected peaks corresponding aluminum-oxygen and silicon-oxygen groups of montmorillonite and magnetite by method of X-ray diffraction. Shown that the size of magnetite particles in the structure of clay is 10-20 nm.

One of the important problems of modern science is to obtain materials with desired properties. In this regard, of particular interest to obtain and study the magnetic properties of sorbents. The structure of magnetic clay obtained by sequential deposition of salts Fe (II) and Fe (III) in the presence of bentonite and ammonia was studied. The diffraction pattern of bentonite clay found two peaks in the 2θ=6,80 and 20,10, corresponding silicon oxide and aluminum-oxygen groups in the structure of montmorillonite - the main component of bentonite.In the spectrum of magnetite also found two peaks at 2θ=30,60 and 37.20, corresponding to γ-Fe2O3 - hematite and FeO•Fe2O3 (Fe3O4) - magnetite.

X-ray analysis of magnetite – clay's system shows a peaks corresponding to the components of bentonite and magnetite. However, the intensity of the peaks was changed.As the concentration of magnetite decreases the intensity of the peaks corresponding to silicon oxide and aluminum-oxygen groups and increases the intensity of the peaks corresponding to the component of magnetite.

Electron microscopic studies of the magnetic clay showed the presence in the structure of bentonite dark spots size of 10-15 nm, corresponding to particles of magnetite. Such particles can be in inter-packet space of montmorillonite. With increasing content of magnetite in the structure of clay until 6.8% increase in the size of magnetite occurs in the structure of clay, which is due to the saturation of cation exchange capacity. The maximum size of the magnetite particles is 20 nm, this corresponds to the size of inter-packet space of montmorillonite.

P-51

P-51