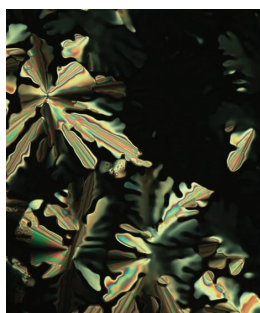


ADVANCED FUNCTIONAL MATERIALS

www.afm-journal.de

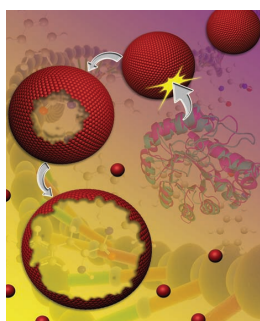
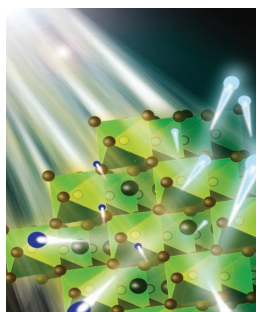


Nanorods

On page 1180, T. Hegmann and team show that gold nanorods decorated with discotic liquid crystals self-assemble into nanorod ribbons both in thin films on TEM grids as well as in the bulk. These nanorods can be aligned with over 75% efficiency based on the calculated order parameter and enhance the charge carrier mobility in the parent discotic liquid crystal host. The image shows the texture of the hexagonal columnar liquid crystal host H6TP doped with the functionalized gold nanorods at 1% by weight.

Organic Heterojunctions

Photocharge generation mechanisms in perovskite solar cells are examined by T.-W. Ng, C.-S. Lee, and co-workers on page 1213. It is found that perovskites/C60 is in fact an inert N–N junction providing no driving force for charge separation. Photovoltaic effects in perovskite solar cells are attributed to direct free-carrier generation within the perovskite film.

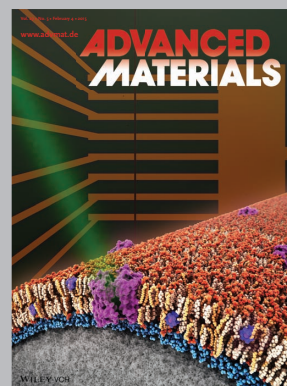
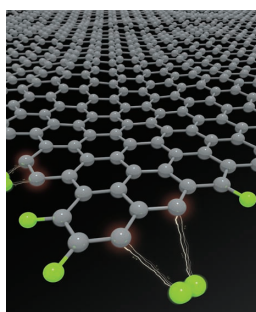


Drug Delivery

Cationic diphenylalanine can self-assemble into biocompatible and biodegradable nanoparticles through cross-linkage of glutaraldehyde. As shown by X. Yan, J. Li, and colleagues on page 1193, such assembled nanoparticles have a typical enzyme-responsive characterization and can be employed as nanocarriers for drug delivery. The doxorubicin-loaded nanocarriers with a lower drug concentration still possess a higher efficiency in killing cancer cells.

Fluorine

Edge-selectively fluorinated graphene nanoplatelets (FGnPs) are produced by H. K. Kim, S. Dou, L. Dai, J.-B. Baek, and co-workers on page 1170 by unzipping graphitic framework in the presence of diluted fluorine gas (green color). Due to the formation of the most stable C–F bonds at the edges, the FGnPs show the profoundly enhanced electrochemical performance in DSSCs and LIBs with excellent cycling stability.



Advanced Materials has been bringing you the best in materials research for over twenty-five years.

With its increased ISI Impact Factor of 15.409, *Advanced Materials* is one of the most influential journals in the field. Publishing every week, *Advanced Materials* now brings you even more of the latest results at the cutting edge of materials science.

www.advmat.de



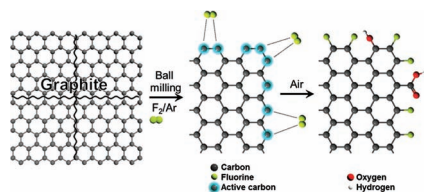
Small is the very best interdisciplinary forum for all experimental and theoretical aspects of fundamental and applied research at the micro and nano length scales.

With an ISI impact Factor of 7.514 and publishing every week in 2015 with papers online in advance of print, *Small* is your first-choice venue for top-quality communications, detailed full papers, cutting-edge concepts, and in-depth reviews of all things micro and nano.

www.small-journal.com

FULL PAPERS

Edge-selectively fluorinated graphene nanoplatelets (FGnPs) are prepared by simple mechanochemical ball-milling graphite in the presence of fluorine/argon (20/80, v/v). The FGnPs demonstrate superb electrochemical performance with excellent stability/cycle life in dye-sensitized solar cells and lithium ion batteries.



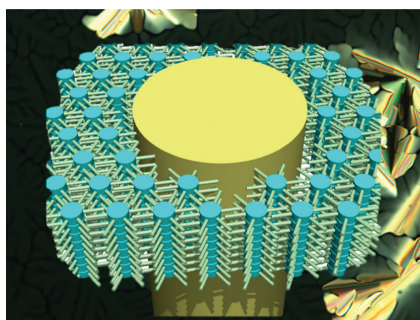
Fluorine

I.-Y. Jeon, M. J. Ju, J. Xu, H.-J. Choi, J.-M. Seo, M.-J. Kim, I. T. Choi, H. M. Kim, J. C. Kim, J.-J. Lee, H. K. Liu, H. K. Kim,* S. Dou,* L. Dai,* J.-B. Baek* 1170–1179

Edge-Fluorinated Graphene Nanoplatelets as High Performance Electrodes for Dye-Sensitized Solar Cells and Lithium Ion Batteries



Tiny amount, big effect: Gold nanorods capped with discotic liquid crystal motifs self-assemble into nanorod ribbons several hundred nanometer long, and can be macroscopically aligned in the parent discotic liquid crystal. At only 1% by weight, these nanorods affect the packing of the host phase leading to an increase in charge carrier mobility in the columnar phase.

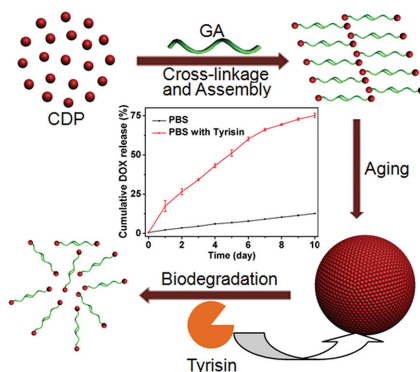


Nanorods

X. Feng, L. Sosa-Vargas, S. Umadevi, T. Mori, Y. Shimizu, T. Hegmann* 1180–1192

Discotic Liquid Crystal-Functionalized Gold Nanorods: 2- and 3D Self-Assembly and Macroscopic Alignment as well as Increased Charge Carrier Mobility in Hexagonal Columnar Liquid Crystal Hosts Affected by Molecular Packing and π - π Interactions

Cationic diphenylalanine (CDP) can assemble into biocompatible and biodegradable nanocarriers through cross-linkage of glutaraldehyde (GA). The nanocarriers can be biodegraded under the action of tyrosin. Importantly, after being loaded with doxorubicin (DOX) the nanocarriers also show a desired enzyme-responsive property, and the release of DOX can be easily achieved in PBS (pH 7.2) with tyrosin.

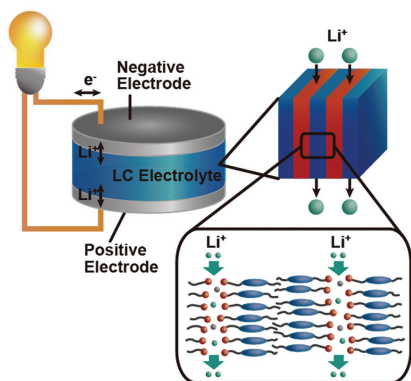


Drug Delivery

H. Zhang, J. Fei, X. Yan,* A. Wang, J. Li* 1193–1204

Enzyme-Responsive Release of Doxorubicin from Monodisperse Dipeptide-Based Nanocarriers for Highly Efficient Cancer Treatment In Vitro

A thermotropic liquid-crystalline (LC) electrolyte for lithium-ion batteries is developed. The LC electrolyte is successfully used for lithium-ion batteries. The electrolyte is a mixture of a carbonate-based rod-like molecule and lithium bis(trifluoromethylsulfonyl)imide. This is the first demonstration of the applicability of thermotropic LC electrolytes to lithium-ion batteries.



Liquid Crystals

J. Sakuda, E. Hosono, M. Yoshio, T. Ichikawa, T. Matsumoto, H. Ohno, H. Zhou, T. Kato* 1206–1212

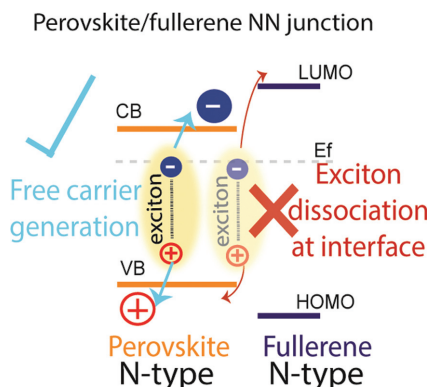
Liquid-Crystalline Electrolytes for Lithium-Ion Batteries: Ordered Assemblies of a Mesogen-Containing Carbonate and a Lithium Salt

FULL PAPERS

Organic Heterojunctions

M.-F. Lo, Z.-Q. Guan, T.-W. Ng,*
C.-Y. Chan, C.-S. Lee* 1213–1218

**Electronic Structures and
Photoconversion Mechanism in
Perovskite/Fullerene Heterojunctions**

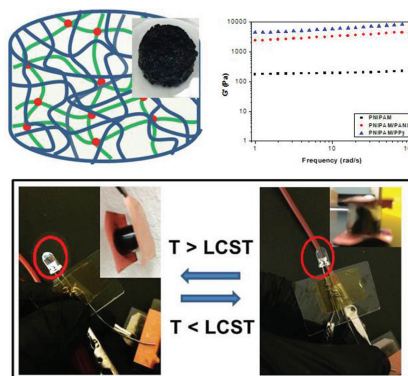


While perovskites/fullerene is commonly assumed to form a type II P–N junction with its internal E-field facilitating exciton dissociation, it is found that perovskite/ C_{60} (PCBM) is a charge inert type I N–N junction. Devices with such a junction show photovoltaic effects effectively, thus photogenerated excitons can indeed dissociate to free carriers in the perovskite film.

Smart Hydrogels

Y. Shi, C. Ma, L. Peng,
G. Yu* 1219–1225

**Conductive “Smart” Hybrid Hydrogels
with PNIPAM and Nanostructured
Conductive Polymers**

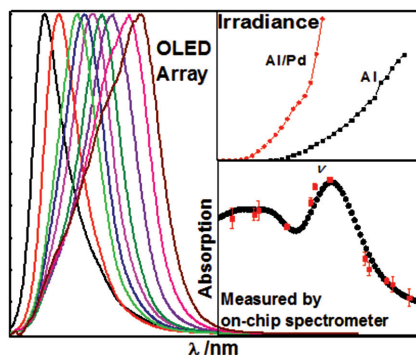


Thermal-responsive and conductive hybrid hydrogels are synthesized by the in situ formation of a continuous network of conductive polymer hydrogels in a poly(*N*-isopropylacrylamide) matrix. The interpenetrating binary network structure provides the hybrid hydrogels with a continuous electron transport path, highly porous microstructure, and strong interactions between networks, thus endowing them with a unique combination of high electrical conductivity, high thermal-responsive sensitivity, and good mechanical properties.

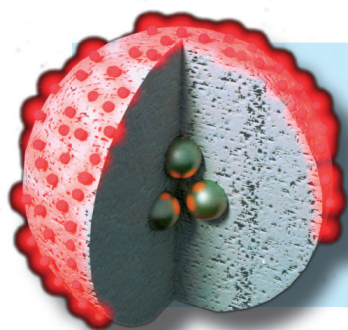
Organic Electronics

E. Manna, F. Fungura, R. Biswas,
J. Shinar,* R. Shinar* 1226–1232

**Tunable Near UV Microcavity OLED
Arrays: Characterization and Analytical
Applications**



Near-UV microcavity CBP-based OLEDs (peak emission ≈ 385 nm) with Al/Pd anode exhibit increased irradiance and lower turn-on voltage in comparison to other CBP-based OLEDs. The peak emission is well aligned with the narrow 385 nm absorption band of the ubiquitous PtOEP. A tunable microcavity OLED array (peak electroluminescence 370–430 nm) is utilized in an all-organic (OLED/sensing film/OPD) on-chip spectrophotometer.



How to contact us:

Editorial Office:

Phone: (+49) 6201-606-286/531
Fax: (+49) 6201-606-500
Email: afm@wiley-vch.de

Reprints:

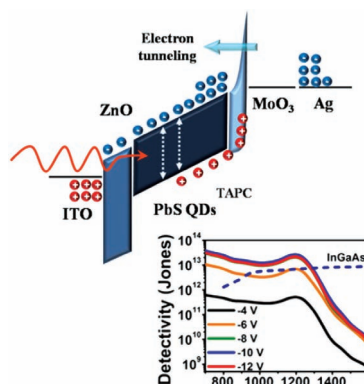
cherth@wiley-vch.de

Copyright Permission:

Fax: (+49) 6201-606-332
Email: rights@wiley-vch.de

FULL PAPERS

High gain solution processed PbS nanocrystals photodetectors with a gain of 187 are demonstrated with an infrared sensitivity up to 1500 nm. The photodetectors have a high detectivity of 7×10^{13} Jones, which is even higher than that of a commercial InGaAs photodiode. The gain is due to the enhancement of electron injection through the TAPC electron blocking layer.

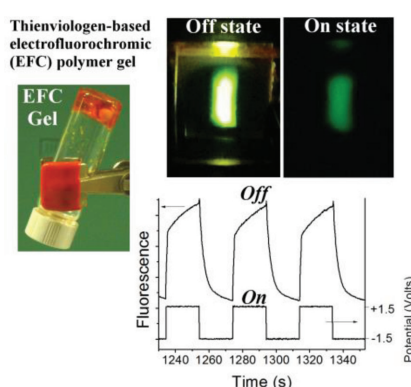


Photodetectors

J. W. Lee, D. Y. Kim, F. So*.....1233–1238

Unraveling the Gain Mechanism in High Performance Solution-Processed PbS Infrared PIN Photodiodes

A single layer ITO/EFC/ITO device is presented where the electrofluorochromic layer is a polymer gel containing the fluorescent thienoviologen dication 4,4'-(2,2'-bithiophene-5,5'-diyl)bis(1-nonylpridinium). Its reduction allows to switch the fluorescence between a high fluorescence off state and a quenched on state in the 470–800 nm spectral range. This device exhibits high fluorescence contrasts, short switching times, and a high cycling lifetime.

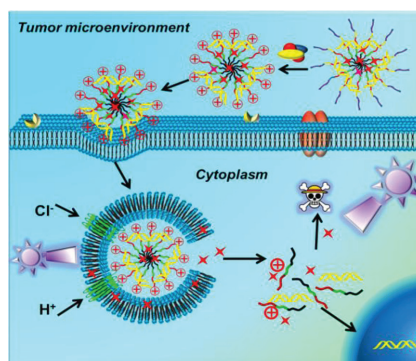


Fluorescent Materials

A. Beneduci,* S. Cospito, M. La Deda, G. Chidichimo.....1240–1247

Highly Fluorescent Thienoviologen-Based Polymer Gels for Single Layer Electrofluorochromic Devices

A MMP-2 responsiveness chimeric peptide is reported to transport the photosensitizer PpIX and DNA to the target cells. Importantly, a dual-stage light irradiation strategy is used to enhance the endosome escape via photochemical internalization. A high therapeutic index is achieved due to the synergistic effect between gene therapy and photodynamic therapy.

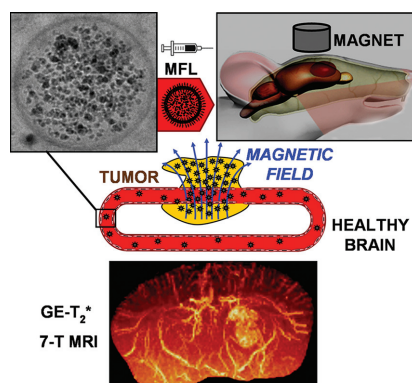


Photodynamic Therapy

K. Han, Q. Lei, H. Z. Jia, S. B. Wang, W. N. Yin, W. H. Chen, S. X. Cheng, X. Z. Zhang*1248–1257

A Tumor Targeted Chimeric Peptide for Synergistic Endosomal Escape and Therapy by Dual-Stage Light Manipulation

Long-circulating lipid vesicles entrapping highly concentrated superparamagnetic nanocrystals of maghemite (MFLs) provide a reliable MRI traceable tool for systemic targeting of intracerebral tumors. As experienced here on human glioblastomas implanted in the striatum of mice, the application of a magnetic field gradient significantly and selectively accumulates MFLs in the malignant neoplasms up to the intracellular level, while sparing healthy brain tissues.



Cancer Therapy

H. Marie, L. Lemaire, F. Franconi, S. Lajnef, Y.-M. Frapart, V. Nicolas, G. Frébourg, M. Trichet, C. Ménager, S. Lesieur*.....1258–1269

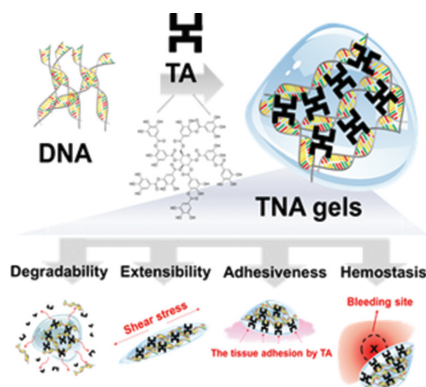
Superparamagnetic Liposomes for MRI Monitoring and External Magnetic Field-Induced Selective Targeting of Malignant Brain Tumors

FULL PAPERS

Hydrogels

M. Shin, J. H. Ryu, J. P. Park, K. Kim,
J. W. Yang, H. Lee* 1270–1278

DNA/Tannic Acid Hybrid Gel Exhibiting Biodegradability, Extensibility, Tissue Adhesiveness, and Hemostatic Ability

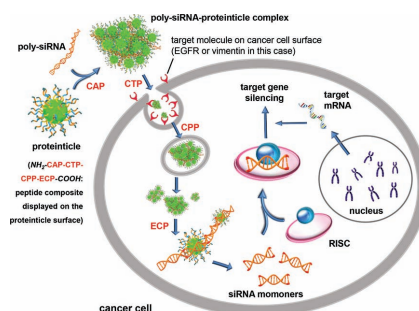


A new concept in DNA gel preparation using a plant-inspired “molecular glue,” tannic acid (TA), is applied in this study. The gel, named TNA (TA + DNA) hydrogel, exhibits unique characteristics not observed in conventional DNA gels: extensibility, adhesiveness, degradability, and hemostatic ability. The crosslinking mechanism via hydrogen bonds enables the large-scale preparation of TNA gel and the release of encapsulated DNA.

RNA Interference

E. J. Lee, S. J. Lee, Y.-S. Kang, J. H. Ryu,
K. C. Kwon, E. Jo, J. Y. Yhee, I. C. Kwon,
K. Kim, J. Lee* 1279–1286

Engineered Proteinticles for Targeted Delivery of siRNA to Cancer Cells

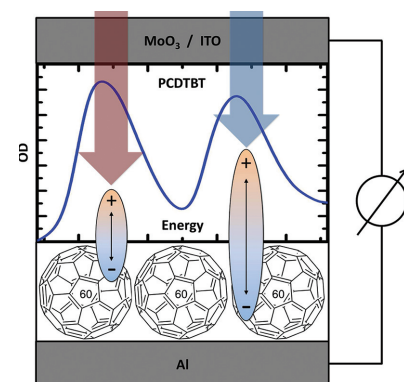


An efficient system for targeted siRNA delivery to cancer cells is successfully developed using genetically engineered human ferritin-based proteinticles. The engineered proteinticles display various functional peptides [cationic peptide to capture siRNA, tumor cell targeting and penetrating peptides (CTP and CPP, respectively), and enzymatically cleaved peptide to release small interfering RNA inside tumor cell] on their surface and show no cytotoxicity.

Photovoltaics

T. Hahn, J. Geiger, X. Blase,
I. Duchemin, D. Niedzialek,
S. Tscheuschner, D. Beljonne,
H. Bässler, A. Köhler* 1287–1295

Does Excess Energy Assist Photogeneration in an Organic Low-Bandgap Solar Cell?

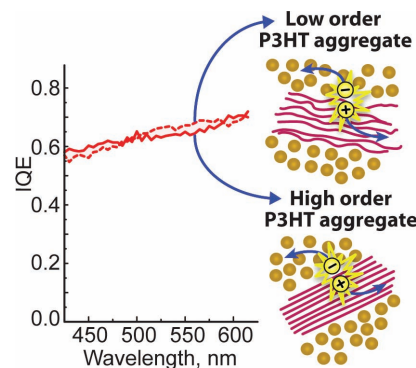


Exciton dissociation in bilayer solar cells is facilitated by exciting into higher-lying, more delocalized excited states of the donor polymer. This is shown by measuring the field dependence of the photocurrent in PCDTBT/C₆₀ cells and in PCPDTBT/C₆₀ cells for different excitation energies and comparing this to the delocalization of the associated excited states as determined by quantum-chemical calculations.

Organic Electronics

O. Awartani, M. W. Kudenov, R. J. Kline,
B. T. O'Connor* 1296–1303

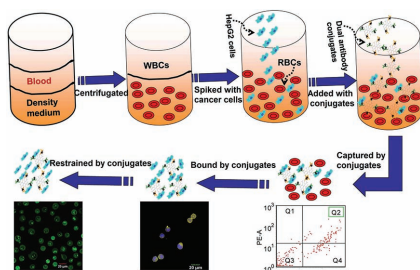
In-Plane Alignment in Organic Solar Cells to Probe the Morphological Dependence of Charge Recombination



The internal quantum efficiency for light absorption in high-order and low-order P3HT aggregates is measured in a single photovoltaic cell, enabled by fabricating devices with polymer in-plane alignment and selective polymer excitation using linearly polarized illumination. The internal quantum efficiency is independent of polarized illumination suggesting losses in disordered films are solely due to charge collection losses.

FULL PAPERS

Synthesized dual antibody-coated nanomaterial conjugates can specifically capture the rare circulating HepG2 tumor cells mixed with large population of red blood cells and HL-60, resulting in down-regulation of HepG2.

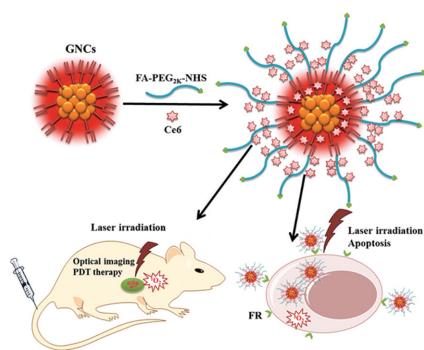


Cancer Therapy

J. Xie, Y. Lu, H. Dong, R. Zhao, H. Chen, W. Shen, P. J. Sinko, Y. Zhu, J. Wang, J. Shao,* Y. Gao, F. Xie, L. Jia* 1304–1313

Enhanced Specificity in Capturing and Restraining Circulating Tumor Cells with Dual Antibody–Dendrimer Conjugates

A novel gold nanoclusters-based Ce6 delivery nano-platform is developed to achieve selective targeting toward cancer cells and tumors combining photodynamic therapy. Systematic in vitro and in vivo experiments evaluate the cellular uptake, light-induced cell apoptosis, biodistribution, as well as FA-directed active tumor targeting and deep-penetration-enhanced photodynamic therapy of the gold nanoclusters-based nanoprobes. The results identify the great potentials of gold nanoclusters for clinical use.



Nanoprobes

C. Zhang, C. Li, Y. Liu, J. Zhang, C. Bao, S. Liang, Q. Wang, Y. Yang, H. Fu, K. Wang,* D. Cui* 1314–1325

Gold Nanoclusters-Based Nanoprobes for Simultaneous Fluorescence Imaging and Targeted Photodynamic Therapy with Superior Penetration and Retention Behavior in Tumors

Save Time and Let the Research Come to You

Sign up for new content alerts for all of your favorite journals:

- ✓ Be the first to read Early View articles
- ✓ Get notified of Accepted Articles when they appear online
- ✓ Receive table of contents details each time a new issue is published
- ✓ Never miss another issue!

Follow these 3 easy steps to register for alerts online:

1

Log into **Wiley Online Library**. If you are not already a registered user, you can create your profile for free.

2

Select "**Get New Content Alerts**" from Journal Tools on the top left menu on any journal page or visit the Publications page to view all titles.

3

Submit your preferences and you are done. You will now receive an email when a new issue of the journal publishes.

12-46060