IS&T/SPSTJ International Symposium on Silver Halide Imaging 2000

“Silver Halide in a New Millennium”

Sainte-Adele, Quebec, Canada
11-14 September 2000

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Thank You AgX 2000 Sponsors

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The Papers Program

Monday, September 11, 2000

8:00 to 10:15 a.m.
Plenary Session
Session Co-Chairs:
Tadaaki Tani, Fuji Photo Film Co., Ltd.; Gary House, Eastman Kodak Company

8:00 a.m. Opening Remarks and IS&T Honors and Awards
8:10 a.m. New Pathways in Silver Halide Imaging
James Rodgers, Eastman Kodak Company
8:50 a.m. Activity in Silver Halide Technology and its Contribution to High Speed and High Quality Color Photography
Shunji Takada, Fuji Photo Film Co., Ltd.
9:30 a.m. From East-West 1 to East-West 5, From Micro- to Molecular-Engineered Material Design: The Past and the Future of AgX-Imaging Systems
Rene De Keyzer, Agfa-Gevaert N.V.

10:10 to 10:25 a.m. Coffee Break

10:25 - 10:55 a.m. Plenary Panel Q & A

10:55 a.m. to 12:10 p.m.
Session 1—Silver Halide’s Role in Future Imaging Systems
Session Co-Chairs:
Tom Brust, Eastman Kodak Company;
Shunji Takada, Fuji Photo FilmCo., Ltd.

10:55 a.m. Film Capture for Digitization
Allan F. Sowinski, Lois A. Buitano, Steven G. Link and Gary L. House, Eastman Kodak Company

11:20 a.m. Film As the Archival and Entertainment Medium of the 21st Century
Harry A. Shamir, ColorCode UnLimited Corp.

11:45 a.m. Silver Halide and Silicon as Consumer Imagers
Richard Szajewski, Eastman Kodak Company
### 12:10 to 1:15 p.m. Lunch Break

### 1:15 to 5:20 p.m.

**Session 2—Advances in AgX Emulsion Design and Characterization**

**Session Co-Chairs:**
- Silvia Karthäuser, Agfa-Gevaert AG;
- Jeff Hansen, Eastman Kodak Company

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<th>Time</th>
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<tr>
<td>1:40 p.m.</td>
<td>Crystal Growth Control of (100)-AgCl-Tabular-Grains</td>
<td>Silvia Karthäuser, Agfa-Gevaert AG</td>
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<tr>
<td>2:05 p.m.</td>
<td>Variation in Silver Chloride Morphology as a Function of Silver Iodide Impurity Level</td>
<td>Thomas B. Brust and Yun C. Chang, Eastman Kodak Company</td>
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<tr>
<td>2:30 p.m.</td>
<td>A Study of Structure and Property of Hollow Silver Halide Microcrystal Emulsions</td>
<td>Kai Huang, Jinpei Li and Sue Wang, Institute of Photographic Chemistry, P.R. China</td>
</tr>
<tr>
<td>2:55 to 3:15 p.m.</td>
<td>Coffee Break</td>
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<td>3:15 p.m.</td>
<td>Atomic Force Microscopy Study on the Surface of Silver Halide Microcrystals</td>
<td>Katsuhiko Suzuki and Sadayasu Ishikawa, Konica Corporation</td>
</tr>
<tr>
<td>3:40 p.m.</td>
<td>Defect Induced Thickness Growth in Silver Chloride (111) Tabular Crystals: A TEM Study</td>
<td>W. Van Renterghem, D. Schryvers and J. Van Landuyt, University of Antwerp; D. Bollen, C. Van Roost and R. De Keyzer, Agfa-Gevaert, N.V.</td>
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<tr>
<td>4:05 p.m.</td>
<td>Influence of the Aspect Ratio of Tabular Grains on the Light Scattering</td>
<td>Thomas Müßig, Agfa Gevaert AG</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>A Balanced Nucleation and Growth Model for Controlled Precipitations</td>
<td>Ingo H. Leubner, Crystallization Consulting</td>
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</table>
4:55 p.m.  Investigation of Kinetics of Recrystallization of Silver Halide Microcrystals By A Turbidimetric Method
Timothy A. Larichev and Elena N. Dyudyaeva, State Univ. of Kemerovo;
M. Y. Young and Hong C. Ahn, Korea Research Institute of Chemical Technology

7:30 to 9:30 p.m. - Dinner Break

Tuesday, September 12, 2000

8:00 to 9:40 a.m.
Session 3 — AgX Photophysics and Latent Image Formation
Session Co-Chairs:
Mitsuo Kawasaki, Univ. of Kyoto; Myra Olm, Eastman Kodak Company

8:00 a.m.  Quantum-Sized Silver, Silver Chloride and Silver Sulfide Clusters
Gion Calzaferri, Dominik Brühwiler, Stephan Glaus, David Schürch,
Antonio Currao, University of Bern, Switzerland

8:25 a.m.  Characterization of Ag Clusters Formed on AgBr Grains By Light and Reduction in Terms of Kubo Effect
Tadaaki Tani and Toshio Tsukada, Fuji Photo Film Co., Ltd.

8:50 a.m.  Transition Metal Dopants With Unusual Ligands
M. T. Olm, R. S. Eachus, W. G. McDugle, R.C. Baetzold
Eastman Kodak Company

9:15 a.m.  Electron Transfer in Solid State Materials I
Sanford H. Ehrlich, Consultant

9:40 to 10:00 a.m. Coffee Break

10:00 a.m. to 12:30 p.m.
Session 4—Chemical and Spectral Sensitization
Session Co-Chairs: Kathy Elst, Agfa Gevaert; Deyin Huang, Shanghai Jiao Tong University

10:00 a.m.  Computational Study of Sulfur Sensitizing Centers on AgBr
Roger C. Baetzold, Eastman Kodak Company
10:25 a.m. Determination of The Silver Sulphide Cluster Size Distribution via Computer Simulations  
E. Charlier and R. Gijbels, Univ. of Antwerp;  
M. Van Doorselaer and R. De Keyzer, Agfa Gevaert, N.V.

10:50 a.m. Imaging Cyanine Dye Aggregates on Silver Halide Emulsion Grains with Atomic Force Microscopy  
Jeffrey C. Hansen, Joe E. Maskasky, Kevin W. Williams, Eastman Kodak Company

11:15 a.m. Direct Observation of Reversible and Irreversible Oxidation of Layered J-Aggregate Supported Above Au(111)  
Mitsuo Kawasaki and Tomoo Sato, Kyoto University

11:40 a.m. Sensitization and Stabilization of AgCl Tabular Crystals Having Low Iodide Content  
Kathy Elst and P. Verrept, Agfa Gevaert N.V.

12:05 p.m. Synthesis and Properties of Some Pyrylium-Squarylium Cyanine Dyes  
Jianguo Chen and Deyin Huang, Shanghai Jiao Tong University

12:30 to 2:30 p.m. Lunch Break

2:30 to 5:30 p.m. - Afternoon Free for Networking

Tuesday Evening 5:30 to 7:30 p.m.  
September 12, 2000

The Poster Session  
Session Chair: Melville R. V. Sahyun, University of Wisconsin

Crystallization and Photographic Properties of Heterocontact AgBr/AgCl Microcrystals  
Boris Sechkarev, Larisa Sotnikova, Fyodor Titov, T. Larichev, Tanya Ignatieva and Alex Utechin, State Univ. of Kemerovo

Spectral Sensitization of Microcrystals a Core-Shell with the Inner Centers of a Photosensitivity  
B. Sechkarev, L. Sotnikova, Marina Ryabova, T. Ignatieva and A. Utechin, State University of Kemerovo
Structural Characterization of Microscopic Defects in (111) AgBrI Microcrystals: Correlation of Stacking Fault Defects to Twin Boundary Morphology

Features of AgHal Crystals Photolysis
Lidiya Novikova and Oksana Esipenko, Kemerovo State University

Photosensitivity of Nanoparticle Silver Halide Dispersions in Fish Gelatin
Shuxin Tan, Jun Yue, Bixia Huang, Sunwen Liu and Lei Song, University of Science and Technology of China

Characteristics of Some Derivatives of Tetraazaindene
Yuan Li, Xiaohui Liu and Deyin Huang, Shanghai Jiao Tong University; Baozhu-Zou Tian, Jing Zhou, Shouyong Ren and Dade Zhang, Lucky Film Co., Ltd.

Photoelectrochemical Water Splitting with AgCl as Photoanode?
Gion Calzaferri, David Schürch, Stephan Glaus and Antonio Currao, University of Berne

Coagulation Mechanism of Nucleation of Tabular Microcrystals at Double-Jet Crystallization
A. G. Kotov, Scientific Centre Niikchimphotoproekt and A. V. Medvedeva, FoMos PLC

Interaction Dye-Dye on a Surface of AgHal T-Grains
A. A. Fadeev, FoMos PLC and B. I. Shapiro, Scientific Centre Niikchimphotoproekt

Phase-Transfer Catalysis in Black and White Development With Hydrophobic DIR-Compounds

Attainable Speed Limits: Effect of The Electrical and Heat Fields on the Photolysis of AgHal Systems
Yuri Breslav, Michael Ushomirsky, Boris Borshevsky and Anatoli Heinman, Russian Society of Photographic Science and Technology

Nuclei of Critical Size and Silver Surface Tension
V. Zakharov and Y. Fedorov, Moscow State University

Effect of Several Inhibitors on Contrast of Silver Halide CTP Printing Plate
Xiujie Hu, Shuyun Zhou and Ping Chen, Institute of Photographic Chemistry, China

Feature of Emulsion Ripening with Octahedral Habit Microcrystals
I. L. Kolesnicova, N. S. Zvidentsova and S. A. Sozinov, Kemerovo State University
Tabular Crystals Formation in Presence of Sulfonic Compounds

J. Spirina, S. Shaikhulina, M. Popova, Kemerovo State University

Laminated Tabular AgBrI Grains With Gradually Varied Iodide Distribution

S. Shaikhulina, E. Terentiev and J. Spirina, Kemerovo State University

Sensitometric Effect of Pre-exposure Heating on Thermally Developed Photographic Materials

Yu. E. Usanov and T. B. Kolesova, S. I. Vavilov State Optical Institute

Fluorescence Dynamic Studies of Cyanine Dyes in Gel-Dried Film and Liquid Emulsion By Femtosecond Fluorescence Up-Conversion Technique

J. W. Oh, K. Ebina, I. V. Rubtsov and K. Yoshihara, Japan Advanced Institute of Science and Technology; T. Suzumto and T. Tani, Fuji Photo Film Co., Ltd.

Preparation of Gold Clusters Dispersed in Gelatin Layer in Using Photographic Film(4): Effect of Emulsion Characteristics

Ken-Ichi Kuge, Michiko Arisawa, Ken-Ichi Kimijima, Tadayuki Shinozawa, Naokazu Aoki and Akira Hasegawa, Chiba University

Photochromic Gel

Valery Zakharov, Nikolay Alekhin and Leonid Aslanov, Moscow State University

A Photographic Film With Reversed Microemulsions of Silver Halide

Chun-Yan Liu, Zhi-Ying Zhang, Institute of Photographic Chemistry, Chinese Academy of Sciences

Influence of Crystalization Rate on Structure of AgBr Emulsion Microcrystals

Sergey Sozinov and Irina Kolesnikova, Kemerovo State University

Photoinitiated Silver Cluster Formation in Agbr Nanocrystals

S. B. Brichkin, V. F. Razumov, M. G. Spirin, Inst. of Problems of Chemical Physics, Russian Acad. of Science

Influence of the Precipitation Method on Defect Formation in Multishell AgBrI (111) Tabular Crystals

W. Van Renterghem, D. Schryvers and J. Van Landuyt, EMAT, University of Antwerp; S. Karthäuser, R. De Keyzer and C. Van Roost, Agfa-Gevaert N.V.

Functioning of Thiocyanate Ions During Sulphur and Sulphur-Plus-Gold Sensitization

E. Charlier and R. Gijbels, University of Antwerp, Belgium; M. Van Doorselaer and Rene De Keyzer, Agfa-Gevaert, N.V.

Formation of Monodisperse Hexagonal Tabular Microcrystals During Growth of AgBr(I) Lateral Shells on an AgBr Core

T. A. Larichev, State University of Kemerovo; T. S. Kang, M. Y. Youn and H. C. Ahn, Korea Research Institute of Chemical Technology
The Exchange of Fluorinated Dyes Between Different Types of Silver Halide Microcrystals Studied By Time of Flight Secondary Ion Mass Spectrometry (TOF-SIMS) Jens Lenaerts, G. Verlinden and Renaat Gijbels, University of Antwerp; Ingrid Geuens and Paul Callant, Agfa-Gevaert N.V.

Models for the Kinetic of Photoelectrons in AgX-Sensors Depending on the Temperature * O. Schroder, Ch. Jenisch, H. Fuess, Th. Müssig, Inst. Fur Angewandte Physik

A False-Sensitized Instant Film for LED Printers Zbigniew J. Hinz and Michael P. Filosa, Polaroid Corporation

The Influence of Iodide Distribution on the Kinetics of Photocharge Carriers in Tabular Crystals Silvia Karthäuser and Thomas Müssig, Agfa-Gevaert AG; C. Jenisch, TUD, FB-Materialwissenschaften; D. Wilken, Institut für Organische Chemie, Martin Luther Universität

Observation and Analysis of Sulfur Sensitization Centers Formed on Octahedral Silver Bromide Grains Hiroyuki Mifune, Masafumi Mizuno, Yoshiaki Toyama, Takefumi Shizawa and Jun Okuda, Fuji Photo Film Co., Ltd.

Electron and Hole Dynamics By Microwave Detected Photoconductivity Transients of AgBr$_{1-x}$I$_x$-Tabular Crystals T. Hahn, J. Niklas, Technical University of Bergakademie Freiberg; Thomas Müssig, Agfa Gevaert AG

The Logistic Imitation of the Color Photosensitive Materials D-T Curve and the Estimation to its Parameter * Li-Chang Han, Col. of Urban and Environmental Sciences, Northeast Normal Univ. China

Semi-Hollow Silver Halide Crystals Containing High-Iodide Content Xu Yong-En, Institute of Photographic Chemistry, Academia Sinica, China

A Plate-set Silver Bromoiodide Grain Xue-Fu Cui, Institute of Photographic Chemistry, Chinese Academy of Sciences

7:30 to 9:30 p.m. - Dinner Break
Wednesday, September 13, 2000
8:00 a.m. to 12:30 p.m.
Session 4 Continued —
Chemical and Spectral Sensitization
Session Co-Chairs: Kathy Elst, Agfa Gevaert; Deyin Huang, Shanghai Jiao Tong University

8:00 a.m. Ultrafast Dynamics of Spectral Sensitization
Keitaro Yoshihara, Koujiro Ebina and S. Kumazaki
Japan Advanced Institute of Science and Technology;
Takeshi Suzumoto and Tadaaki Tani, Fuji Photo Film Co., Ltd.;
Igor V. Rubtsov, Institute for Chemical Physics Research, Russia

8:25 a.m. Recent Advances in the Photochemistry of Cyanine Dyes
M. R. V. Sahyun, University of Wisconsin, Eau Claire

8:50 a.m. Influence of Molecular Arrangements on the Properties of Polymethine Dye Aggregates
Takashi Katoh, Keizo Ogawa, and Yoshio Inagaki, Fuji Photo Film Co., Ltd.;
Renji Okazaki, Japan Women’s University

9:15 a.m. Design and Principles of Two-Electron Sensitization By Fragmentable Electron Donors
Annabel Muenter, Jerry Lenhard, Samir Farid, Ray Eachus,
Steve Godleski, Paul Zielinski, Eastman Kodak Company;
Ian Gould, Arizona State University

9:40 to 10:00 a.m. Coffee Break

10:00 a.m. Measurement and Analysis of Adsorbed Amount of a Sensitizing Dye on Each AgBr Grain By Microscope Spectroscopy
Katsuhiro Yamashita, Fuji Photo Film Co. Ltd.;
Asanuma Hiroyuki, University of Tokyo

10:25 a.m. Supramolecular Architectures of Spectral Sensitizers in Two and Three Dimensions
P. Callant and G. Deroover, Agfa-Gevaert N.V.

10:50 a.m. Effects of Iridium Doping and Chemical Sensitization on Reciprocity Law Failure and Latent Image Stability
Masanobu Miyoshi, Shuji Murakami, Koichiro Kuroda, Konica Corporation

11:15 a.m. Effect of Iridium Doping in Cubic and Octahedral AgBr Grains on the Latent Image Formation Process
M. Slagt, Y. Iwasa, Fuji Photo Film, BV; T. Owaki and A. Hirano,
Fuji Photo Film Co. Ltd.
11:40 a.m.  Study of Size-Selection and Ionic Deposition of Silver Sulfide Sensitization Clusters on AgBr Microcrystals
Xiang Zhao, Weidong Cui and Bixian Peng, Institute of Photographic Chemistry, Chinese Academy of Sciences; Peng Liu, Chunying Han, Zhen Gao, Qihe Zhu and Fanao Kong, State Key Laboratory of Molecular Reaction Dynamics, Institute of Chemistry, Chinese Academy of Sciences

12:05 to 1:30 p.m. Lunch Break

1:30 to 5:35 p.m.
Session 5 —Photothermographic Technology and Systems
Session Co-Chairs:
James Reynolds, Eastman Kodak Company; Yoshihiko Suda, Konica Corporation

1:30 p.m.  Thermal Behaviour of Silver Behenate-Based Dry Processable Image-Forming Materials
Ingrid Geuens, Agfa Gevaert N.V.; Iris Vanwelkenhuysen and Renaat Gijbels, University of Antwerp

1:55 p.m.  Numerical Model for Characteristic Curves of Photothermographic Materials Using Semiempirical Simulation Method
Tsukasa Ito, Shu Nishiwaki and Tsuyoshi Mitsuhasi, Konica Corporation

2:20 p.m.  The Reaction Mechanism of Thermally Developed Photographic System Based on Silver Carboxylate
T. Maekawa, M. Yoshikane, H. Fujimura and I. Toya, Fuji Photo Film Co., Ltd.

2:45 p.m.  Atomic Force Microscopy, Far-Field and Near-Field Fluorescence Microscopy, Three Complementary Techniques to Visualize the Spatial Distribution of Behenic Acid
Lieve Bastin, Christian Catry, Iris Cuppens, Karin Jeuris, Carine Jackers and Frans De Schryver, Catholic University of Leuven; Frank Ruttens, Agfa-Gevaert N.V.

3:10 to 3:30 p.m. Coffee Break
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<tr>
<td>3:30 p.m.</td>
<td>The Meaning of Catalytic Contact Or Close Proximity Between Silver Halide and Organic Silver Salt in Photothermographic Materials</td>
<td>Hans Strijackers and Chris Van Roost, Agfa Gevaert N.V.</td>
</tr>
<tr>
<td>3:55 p.m.</td>
<td>Autocatalytic Formation of Silver Particles During Photographic Development</td>
<td>K. Winkelmann and G. Mills, Auburn University</td>
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<tr>
<td>4:20 p.m.</td>
<td>On the Role of Microcrystalline Silver Bromide in the Development Process of Photothermally Developed Materials of the “Dry Silver” Type</td>
<td>Yu. E. Usanov, State Optics Institute, Russia</td>
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<tr>
<td>4:45 p.m.</td>
<td>The Formation of Silver Particles During the Decomposition of Long Chain Silver Carboxylates</td>
<td>B. Bokhonov, Institute of Solid State Chemistry; Yu. Usanov, Vavilov State Optical Institute, Russia; L. Burleva and D. R. Whitcomb, Eastman Kodak Company</td>
</tr>
<tr>
<td>5:10 p.m.</td>
<td>Synchrotron Radiation - Powerful Instrument for Production of New Materials in the New Millennium</td>
<td>B. P. Tolochko, B. B. Bokhanov, V. F. Pindyurin, V. I. Kondratev, Institute of Solid State Chemistry and Institute of Nuclear Physics</td>
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7:30 to 9:30 p.m. - Dinner Break

Thursday, September 14, 2000

8:30 a.m. to Noon

Session 6 — Color Forming Technologies

Session Co-Chairs:
Wolfgang Schmidt, Agfa Gevaert AG;
Jon Staples, Eastman Kodak Company

8:30 a.m. | New Coupler Technologies                                                                                   | Sundaram Krishnamurthy, John Harder and Robert F. Romanet, Eastman Kodak Company     |
| 8:55 a.m. | Separating Developer and Amplifier Baths: Achieving Process Stability and Superior Image Quality in a Low Silver System, | Kazuhiro Miyazawa, Yoshihiko Suda, Noriyuki Kokeguchi, Junji Itoh, Konica Corporation |
9:20 a.m. Qualitative Study of the Kinetics of the Color Formation of a Color-Forming Material By Time-Resolved Specular Transmission
Kris Viaene and Rene De Keyzer, Agfa Gevaert NV

9:45 a.m. A Color-Forming Reaction in the System of Reversed Microemulsions
Chun-yan Liu, Zhi-ying Zhang, Xue-Fu Cui, Institute of Photographic Chemistry, Chinese Academy of Sciences

10:10 to 10:30 a.m. Coffee Break

10:30 a.m. Investigation of Ionization and Coupling Mechanisms for Pivaloyl-acetanilide Yellow Couplers Bearing o-Sulfonamidophenoxy Coupling-Off Groups
Michael P. Youngblood, T. R. Welter and F. Abu-Hasanayn, Eastman Kodak Company

10:55 a.m. Evolution of Automated Turn-Key System for the Production of Rainbow and Reflection Holograms
David Ratcliffe, Alexey Rodin, Stanislovas Zacharovas
1UAB GEOLA, Vilnius, Lithuania, 2Institute of Physics, Vilnius, Lithuania

11:20 a.m. Recent Advances in Holographic Materials Chemical Processing From Geola
Stanislovas J. Zacharovas, Alexey M. Rodin, David B. Ratcliffe
1UAB GEOLA, Vilnius, Lithuania, 2Institute of Physics, Vilnius, Lithuania

11:45 a.m. - 12:00 p.m. Concluding Comments

12:00 to 1:30 p.m. Farewell Luncheon

* Asterix indicates paper not available at time of publication