

# INVESTIGATIONS in PHOTOCHEMICAL ENGINEERING for MOTION PICTURE FILM

*Part I: The Handmade, Silver Gelatin Emulsion*

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## Abstract

Working with motion picture film today is both an intimidating prospect as well as an exciting one -- prior to this point in history, film was the product of a highly competitive industrial science which rapidly developed from the primal photographic processes of the late 18th century to the multi-layered, monopack films of meticulously engineered silver halide grains produced today. Despite this maturity, however, film was never anything more than a means-to-an-end for an industry which never really cared to understand what film was or what film could be. Given the comparative convenience of digital photography, therefore, both the technological and theoretical development of film has undergone a widespread abandonment among industry figures. However, in the wake of this abandonment, we've also been left with perhaps the most intriguing of opportunities: to take this industrial science and build within it a new medium with new ways of speaking, new ways of thinking and new ways of seeing...

In this first part of a series of investigations into photochemical engineering, we will be focusing on preliminary theories concerning emulsion chemistry and it's practical application in the contemporary darkroom. Topics that will be explored include the history of silver gelatin photographic materials, the theory of emulsification and latent image formation, and the practical experimentation of various techniques for hand making motion picture film. The seminar will culminate in a simple silver gelatin emulsion which we will coat on to pre-existing 35mm cellulose triacetate and then photograph and develop as a negative.

## Workshop Details

Number of Participants - 15

Requirements for participation - Previous experience with film processing is recommended, but not required. All prospective participants should request registration via email at [contact@processreversal.org](mailto:contact@processreversal.org)

Cost - 10.00 USD

Date & Time - March 15th; 11:00 AM - 7:00 PM

Venue - Macky Auditorium, Room 1B03C

Instructor - Kevin Rice & Robert Schaller

## Press materials

Images for listings

<http://processreversal.org/ftp/images/emulsion/>

<http://processreversal.org/blog/handmade-emulsion-images/>

Videos for listings

<http://vimeo.com/77449068>

## Facility & Equipment Requirements

*\* Can be provided by instructors...*

### Safety Gear

- 15 pairs of nitrile gloves
- 15 pairs of safety glasses
- 15 aprons
- 15 dust masks

### Emulsification Room

- Adequate safe lights (Kodak OC or equivalent)
- 3 Timers
- 3 standard hot plate
- 3 magnetic stirrer & hot plate w/ teflon coated magnet\*
- 1 heat resistant, 1000.0 ml volume, glass beaker\*
- 6 heat resistant, 250.0 ml volume, glass beakers\*
- 6 heat resistant, 100.0 ml volume, glass beakers\*
- 2 graduated cylinder, 50.0 ml volume (ideally glass)\*
- 2 graduated cylinder, 100.0 ml volume (ideally glass)\*
- 9 glass thermometers within the range of -10 C and 110 C\*
- 9+ glass stirring rods\*
- 6 plastic syringes, 50.0 ml capacity or greater\*
- 1 Scale with 0.1 g resolution or better\*

### Coating Room

- Brushes for coating
- Large glass sheets for coating
- 100 yards of string
- 100 paper clips

### Printing and developing dark room

- Sink with running water
- Adequate safe lights (Kodak OC or equivalent)
- Buckets, Trays or reels for development of the film
- Contact Printer

- and / or -

- Enlargers, set-up with accurate timers and Glass Plates for contact printing

- and / or -

- Sync Block and Rewinds for making a simple contact print

- and / or -

- Bolex\*

### Light room / screening room

- Light Table
- Rewinds
- Split Reel
- Projector

## Expenses

All chemistry cost are based off of ArtCraft Chemical's catalog.

Emulsion Chemistry

50.0 grams, Silver Nitrate.....	47.50 USD ( <a href="#">link</a> )
100.0 grams, Potassium Bromide.....	5.00 USD ( <a href="#">link</a> )
100.0 grams, Active Gelatin.....	5.00 USD (grocery store)
2 gallons, Distilled Water.....	2.64 USD (grocery store)
1.0 Liter, Everclear grain alcohol.....	17.00 USD (liquor store)

Processing Chemistry

1.0 Gallon D-76, or comparable developer.....	7.00 USD
1.0 Gallon Hardening Fixer.....	7.00 USD

Other Misc. Materials

Film Stock w/ Substrate.....	MKT
Brushes and applicators.....	1.00 USD
2 Oz Paper Cups.....	2.00 USD

Travel Expenses

Travel expenses based on approx. cost of gas.

Robert Schaller.....	40.00 USD
Kevin Rice.....	20.00 USD

<b>Total estimated cost.....</b>	<b>154.14 USD</b>
<b>Minimal cost per participant.....</b>	<b>10.00 USD</b>

## Frequently Asked Questions

**Q:** I've never worked with motion picture film before. Will that limit my experience?

**A:** While previous experience with working with motion picture film is not required for attending this workshop, it is highly encouraged that one at least study basic black & white negative processing prior to the workshop. Regardless, we will do everything possible to clarify any questions that you may have before, during or after the workshop.

**Q:** I have some film I would like to bring into the workshop to work with. Is this okay?

**A:** Yes, participants are encouraged to bring in previously processed film for use in contact printing. Additionally, participants should consider bringing in objects for photogramming as well.

**Q:** I would like to travel to attend the workshop, but I'm not certain if I can afford housing accommodations. Do you offer scholarship?

**A:** We unfortunately do not have any funds to provide scholarships, but we may be able to find volunteers to help you with accommodations. Please send us an inquiry at [contact@processreversal.org](mailto:contact@processreversal.org)

**Q:** I missed the opportunity to attend this workshop. Will you be running it again?

**A:** Since this is a one-off series of seminars, we technically won't be able to offer this specific workshop again. However, we're open to trying to organize a similar themed workshop, if the demand exist.