

FRENKEL DEFECTS

NOTES

The photosensitive material is formed of a multitude of silver halide crystals, suspended in gelatin, without which we would not be able to record a latent image and amplify it accordingly in the reduction of the material.

These crystals are produced by the electrovalent bonding of silver ions and halogen cations (e.g. bromide, chloride, iodide, etc.) wherein the ions sequentially architect themselves into an electrically neutral, cubic lattice structure. Figure 1.3 below illustrates such a structure, when perfectly formed; a lattice of silver bromide, the most common silver halide in photography:

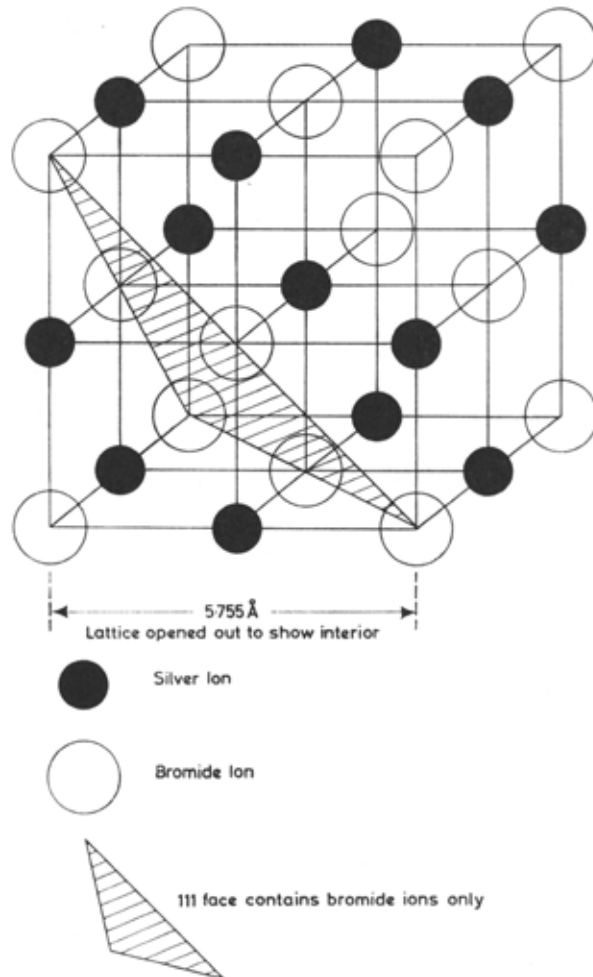


Fig. 1.3 Representation of silver bromide lattice

26 Pulse Wrought (Film for Rewinds) Vol. I Windows for Recursive Triangulation

Andrew Busti (Process Reversal) - 30 meters, Optical Sound

"The first film in a series of coded letters. A film for illumination and inspection; exploring travel from east to west and from west to east. Reflecting on the setting Sun of the Winter Solstice, the crux of increasing light... seen setting over the Pacific."

Yes it is here...it is here, where we are...

Salt

Martha Jurksaitis (Cherry Kino) - 80 meters, MOS

"A vision of women playing in the sea at Saltburn in North Yorkshire becomes a celebration of the material nature of film. The silver salts in film that react to light also react to the metallic salts in film toners, and a multi-coloured seascape emerges from the salt of the sea. Filmed on a part of the beach that was once notorious for shipwrecks, Salt is a love letter to film and to the churning, crashing, passionate sea."

I Swim Now

Sarah Biagini (Process Reversal) - 90 meters, Optical Sound

"I Swim Now challenges the visual intelligibility of landscape aesthetics by imagining the experiences of one Violet Jessop, a stewardess on board all three sister ships of the White Star Line – the Olympic, the Titanic, and the Britannic – while each suffered varying degrees of collision and wreckage at sea. I Swim Now evokes the intense brutality and repetition of Violet's unique physical interactions with nature through an expansive accumulation of optical techniques and manipulations."

Beneath your skin of deep hollow
(Bajo tu lámina de agujero profundo)

Malena Szlam (Double Negative) - 30 meters, MOS

"Originally shot and edited in a Super-8 camera, Beneath Your Skin of Deep Hollow translates nights into arrhythmic movements of light and a fugue of color. Shimmering impressions emerge into the surface of agitated stillness while darkness illuminates reflections and sight."

Of important note, however, is the apparent lack of photo sensitivity within a perfect, silver halide crystal. Rather, it appears that the crystals photo-mechanical properties rely on the formation of defects within the lattice — particularly, the Frenkel defect.

A Frenkel defect is a fault within the crystal wherein an ion is omitted from its usual position in the lattice and, in order to maintain electrical neutrality, placed within a non-lattice, interstitial position. Figure 4.10 illustrates such a defect within a silver-bromide halide.

This figure also shows that the appreciably larger bromide ions cannot, because of their size, be located in interstitial positions. Rather, it is the smaller silver ions which are moved from their usual place; these ions located in the interstitial positions are thus called interstitial silver ions.

Additionally, these interstitial ions do not remain in a static position, but instead are allowed to move throughout the cubic lattice structure freely.

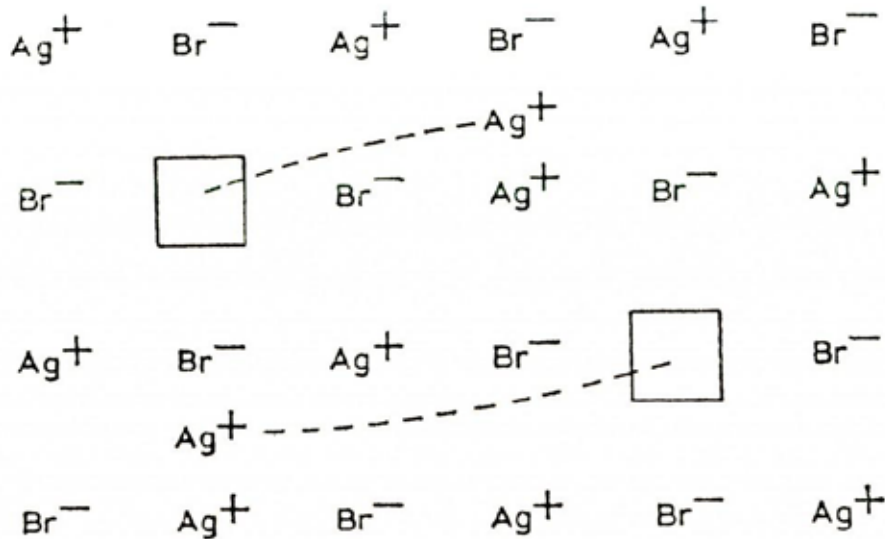


Fig. 4.10. A Frenkel Defect

Rewards

Mariya Nikiforova (Balagan Films) - 60 meters, Optical Sound

"A destructive physical and chemical process reveals hidden energies in a forgotten Boston green space. The resulting debris alternately evoke graffiti, stained glass, natural decomposition, and the effects of heatstroke on a tired brain. The minimally sourced soundtrack, composed in collaboration with Stefan Grabowski, explores the way in which we sometimes "hear" what we see and vice versa."

Perceptual Subjectivity

Philippe Leonard (Double Negative) - 60 meters, Optical Sound

"Ideas take shape in a kind of cerebral magma where the referents are assigned to parcels of experience from which intelligible elements are formed. Perceptual Subjectivity is an essay on the structural formation of thoughts."

At Hand

Andrew Busti (Process Reversal) - 90 meters, Optical Sound

"An exorcism, an exploration, and an unveiling. A subconscious landscape of a withering relationship."

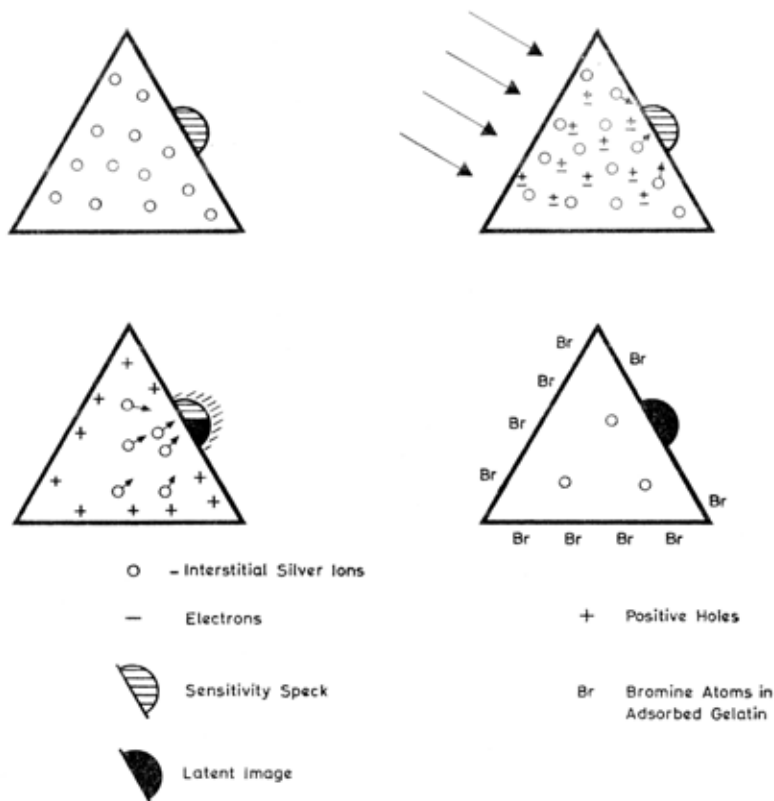
Corn Mother

Taylor Dunne (Process Reversal) - 30 meters, MOS

"A single cartridge of Super 8 captures my mothers last visit to her garden. Her body is seen slowly dissolving towards illumination, while her image is forever immortalized in light and silver. Poem borrowed from the Wabanaki creation myth of the first woman, The Corn and Tobacco Mother."

Figures 9.1 - 9.4 illustrate the mechanics of latent image formation as theorized by Gurney & Mott. In their theory, the interstitial ions of the Frenkel defect, upon exposure to light, are allowed to move freely within the crystal lattice to a "sensitivity spec." As these interstitial ions continue to migrate, the crystals sensitivity spec gradual forms into a faint, solid silver grain. It is this grain which acts as the supposed "latent" image -- the catalyst for amplification (i.e. development), without which we could not render a usable photographic image upon the film strip.

However, perhaps the most interesting aspect of the Frenkel Defects (at least in the vein of this program) is not specifically it's photo-mechanical properties, but the implication that film must be imperfect to function. In this sense, the silver halide might also be seen as a reflection of our films and ourselves, both which, arguably, necessitate a mode of imperfection. Further, we might also consider that projection is a form of photography, one whereby we, the audience, are the photosensitive material -- full of defects -- that is allowed to be imprinted with a latent image. That latent image is in turned processed, printed, projected, over and over again. That is this program...



Figs. 9.1—9.4 Gurney—Mott mechanism for latent-image formation

SEE/SAW

Charlie Egleston (LOMAA) - 50 meters, MOS

"A film about seeing and having seen. Completely hand-processed and painstakingly edited, 'SEE/SAW' is comprised of a series of iris fades - commonly found in silent films to signal the beginning or end of a scene - re-appropriated as a formal approach that frames the desire to see and to remember. Dichotomies surface in the high contrast images - opening/closing, beginning/ending, light/dark - it is also a deeply personal film that faces the imminence of not being."

DER SPAZIERGANG

Margaret Rorison (Sight Unseen) - 30 meters, Optical Sound

"This film documents long walks throughout Berlin, Germany during the cold days of April, 2013.

The film is edited in camera and composed of single frame snapshots along with longer moments of glance, captured on one 100' roll of film.

The title comes from a story by Robert Walser."

To the Beach

Robert Schaller (Handmade Film Institute) - 100 meters, Optical Sound

"One hears in the sea's call the feeling of a promise made to us before birth, that we can know the world not merely as an atlas of things seen, but rather as a continuum of felt experience in which it is impossible to distinguish between our selves and the world around us: self and other are melded into one. To the Beach explores this feeling from three vantage points, filmed (respectively) near, in, and under the sea using a variety of techniques, and registers the resulting images onto hand-made film emulsion.

- I. Approaching the Shore: in which the ocean first offers its irresistible salty scent.
- II. Swimming: in which we become again what we are.
- III. Seeing Stars: as above, so below.

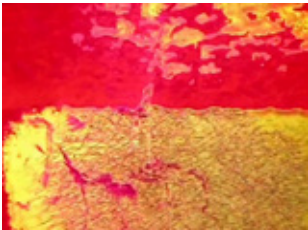
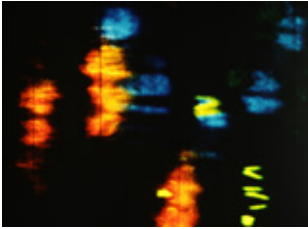
Music by John Drumheller."

Sanctuary

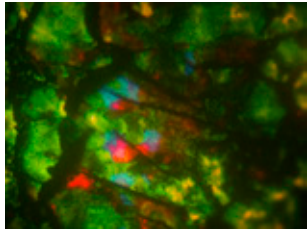
Kevin Rice (Process Reversal) - 30 meters, MOS

No Description...

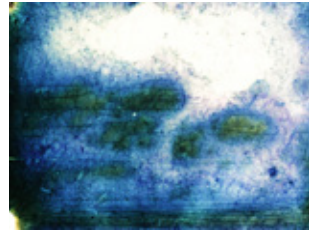
REEL I



REEL II



REEL III



Andrew Busti
 Sarah Biagini
 Taylor Dunne
 Charlie Egleston
 Martha Jurkastis
 Mariya Nikiforova
 Kevin Rice
 Margaret Rorison
 Robert Schaller
 Malena Szlam
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