A SEM Tip for Examining Mixtures of Mineral and Organic Particles

The usual practice is to mount the sample in a quick-setting epoxy resin, with most of the sample in the bottom. I use silicon rubber cups with a one inch inside diameter, about 1/2 inch deep. Mix particles and resin together, about 50/50, put that in the bottom of the cup, then fill with clear resin. The set resin is then ground on a graded series of sandpaper disks with water running on them, then polished on 5 micron diamond suspension to cross-section the particles. The sample is then gold or carbon coated.

Organic or polymer particles and minerals are easily separated by back-scattered imaging (BSE). The organics, being composed of light elements, will show darker than the mineral, which is composed of heavier elements. I usually use a 20 kV e-beam for BSE imaging, then vary the condenser lens to adjust the contrast and illuminate the phases I'm interested in. You can also try adjusting the kV of the beam to light up the phases of interest. A photo of secondary electrons and BSE of the same area is often helpful.

Particle size measurements may be better on a sample of grains sprinkled on a sticky tab and imaged by BSE, but topographical interference, i.e., shadows, may degrade the analysis.

Mary Mager, University of British Columbia

Supravital Stain for blood.

Paul Ehrlich pioneered the air-dried blood smear before the turn of the century. Air-dried, because wet fixatives washed the specimen off of the slide. Various stains were tried at first, but eventually the Romanowski stains (Wright's Giemsa, etc.) prevailed. When a smear is air-dried, the spherical white cells flatten out to become discs, introducing a number of artifacts, notably loss of nucleolar staining.

For some artifactual reason, nucleolar staining is retained in many leucemic cells, leading to the term "blast". However, with wet fixation or with supravital staining of live cells, even normal, mature small lymphocytes contain nucleoli.

So information obtainable from blood staining depends more on the mode of fixation than on the stain.

Wet fixation of a blood clot is almost useless because of the overwhelming preponderance of red blood cells. Wet fixation of a buffy coat is possible if it is treated as a cell block, but centrifugation introduces a few relatively minor artifacts of its own. Any specimen that is embedded in paraffin undergoes considerable shrinkage during alcoholic dehydration.

Supravital staining means putting a small drop of blood on a stained slide...