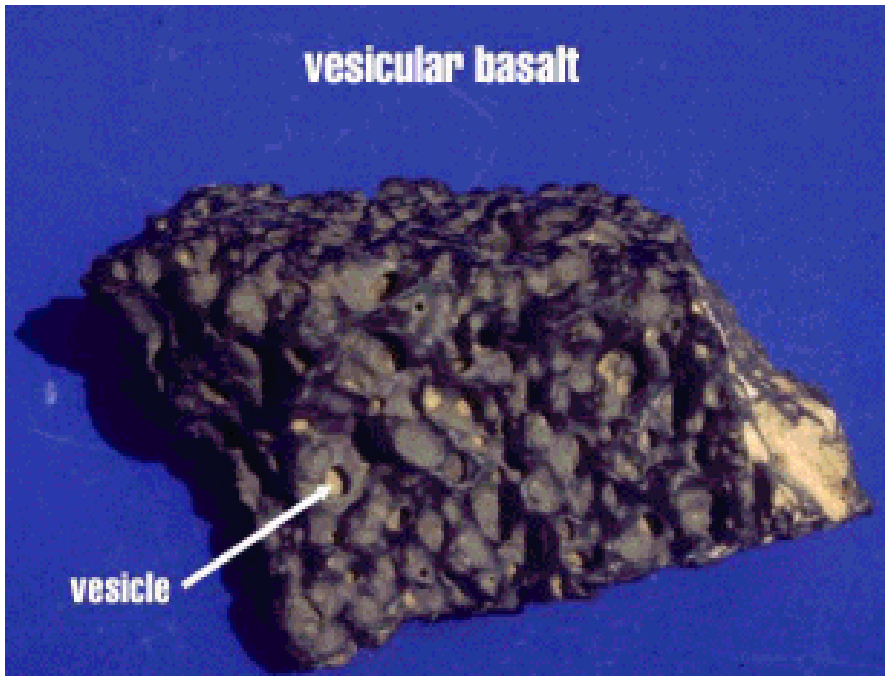
TEXTURES OF IGNEOUS ROCKS

EMR 221

Glassy Texture

- Glassy textured igneous rocks are non-crystalline meaning the rock contains no mineral grains. Glass results from cooling that is so fast that minerals do not have a chance to crystallize. This may happen when magma or lava comes into quick contact with much cooler materials near the Earth's surface. Pure volcanic glass is known as obsidian (see photo)

Vesicular Texture

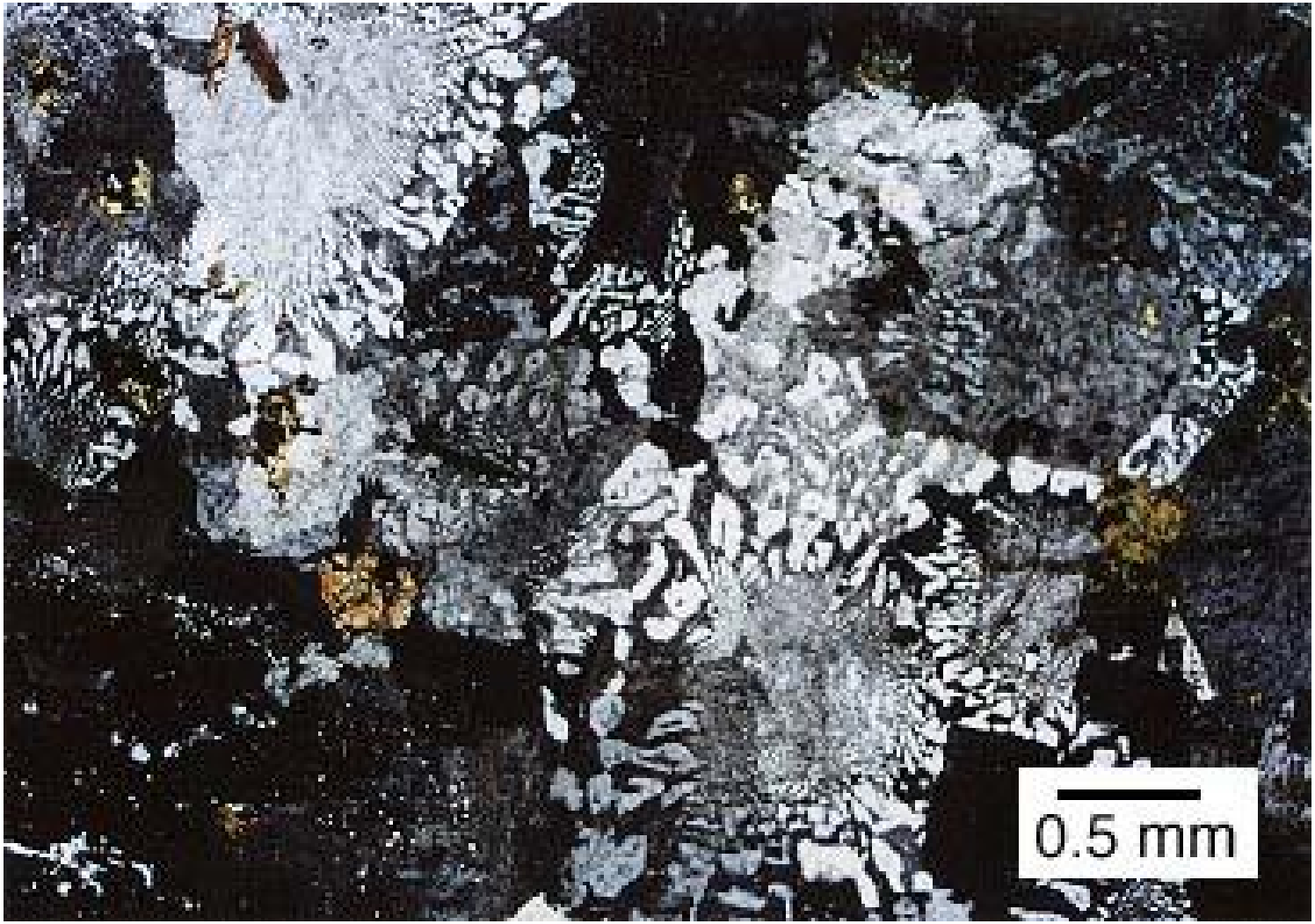


- This term refers to vesicles (holes, pores, or cavities) within the igneous rock. Vesicles are the result of gas expansion (bubbles), which often occurs during volcanic eruptions. Pumice and scoria are common types of vesicular rocks. The image to the left shows a basalt with vesicles, hence the name "vesicular basalt "

Fragmental Texture

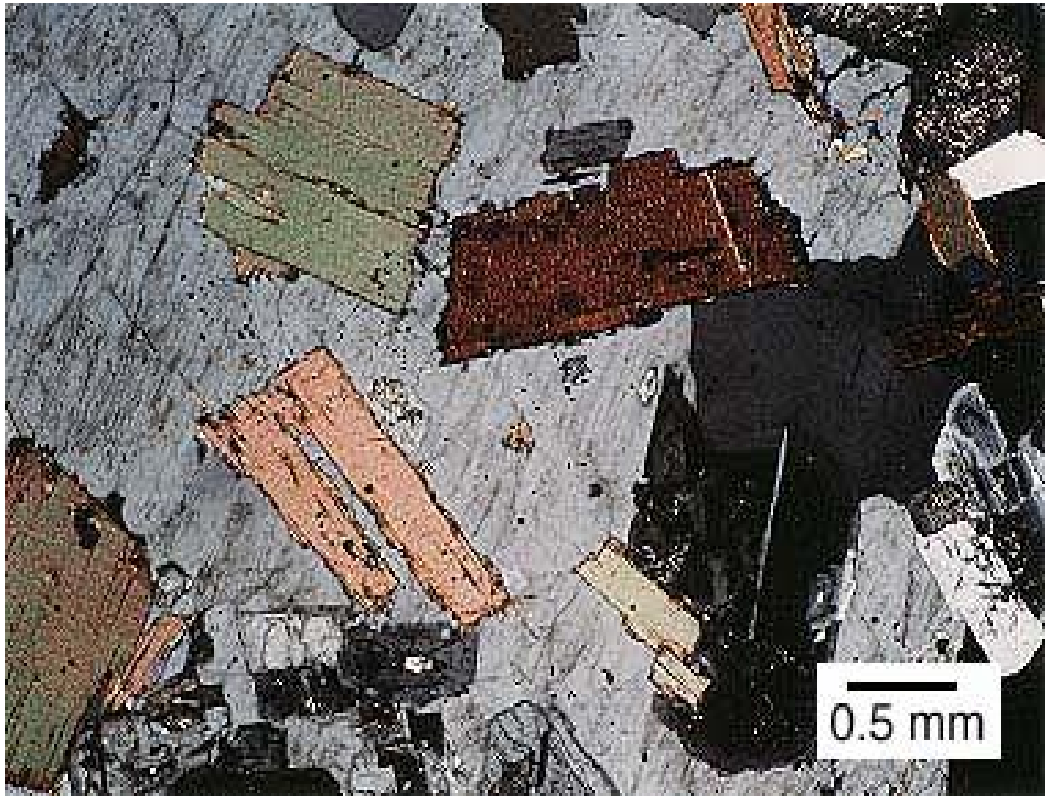
- These rocks are collectively termed fragmental. If you examine a fragmental volcanic rock closely you can see why. You will note that it is comprised of numerous grains or fragments that have been welded together by the heat of volcanic eruption. If you run your fingers over the rock it will often feel grainy like sandpaper or a sedimentary rock. You might also spot shards of glass embedded in the rock. The terminology for fragmental rocks is voluminous, but most are simply identified as tuff

Micrographic quartz and K-feldspar (cuneiform shaped intergrowths) dominate this rock. Granophyre



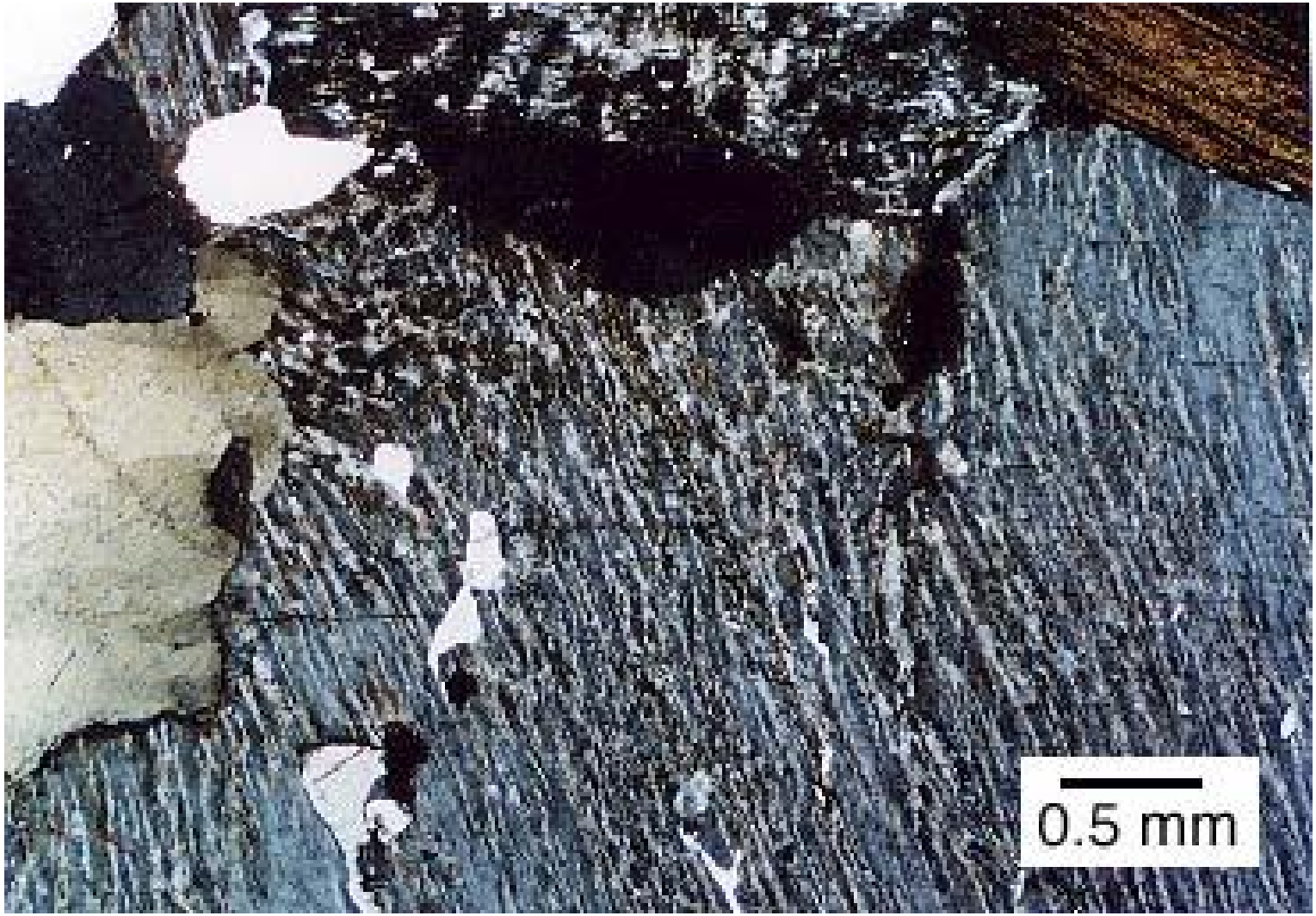
Myrmekitic texture defined by wormy (rounded) intergrowths o quartz and K-feldspar in plagioclase which is adjacent to K-feldspar. Probably forms as a result of subsolidus exchange. Compare this texture to micrographic texture.

Poikilitic (or ophitic) texture



In this photomicrograph, euhedral to subhedral biotite and plagioclase crystals are surrounded by optically-continuous, gray-colored K-feldspar.

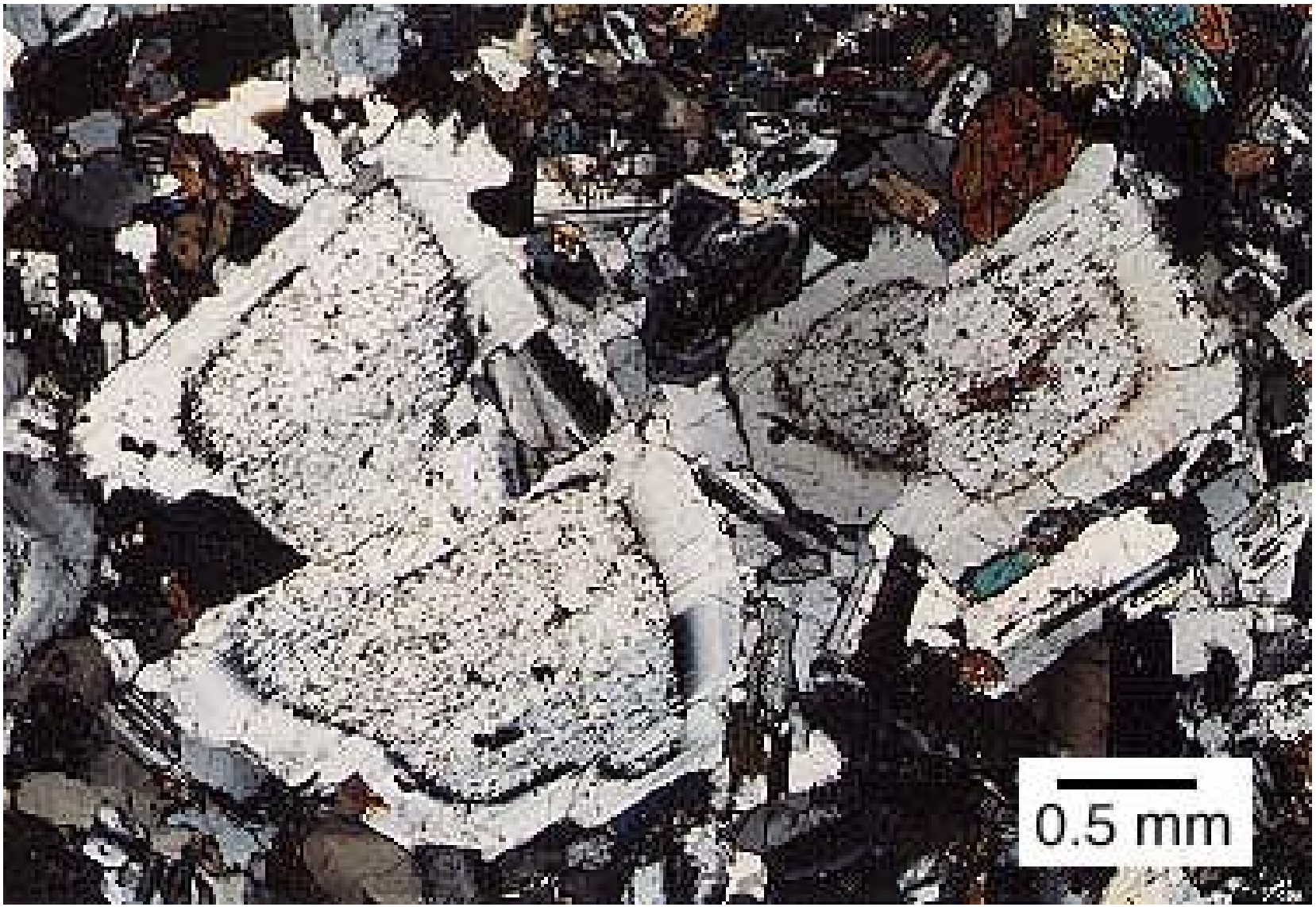
The light gray streaks in this photomicrograph are plagioclase Exsolution lamellae in gray K-feldspar. Perthite forms as an originally homogeneous feldspar exsolves two feldspars as temperature falls below the feldspar solvus during sub solidus cooling. Perthite



Sieve texture
next slide

- Sieve texture in corroded, partially resorbed plagioclase corses. It is thought that this texture may be formed in at least two ways. If a plagioclase crystal is placed into a magma in which it is not in equilibrium (by magma mixing), it will become corroded, and melt will penetrate into the crystal structure. The crystal may also become rounded by partial resorption. New plagioclase of a different composition will precipitate from the magma and perhaps form a rim around the corroded core. Alternatively, the same effects could possibly be produced by volatile-loss from decompression as a magma rises to shallower regions in the crust.

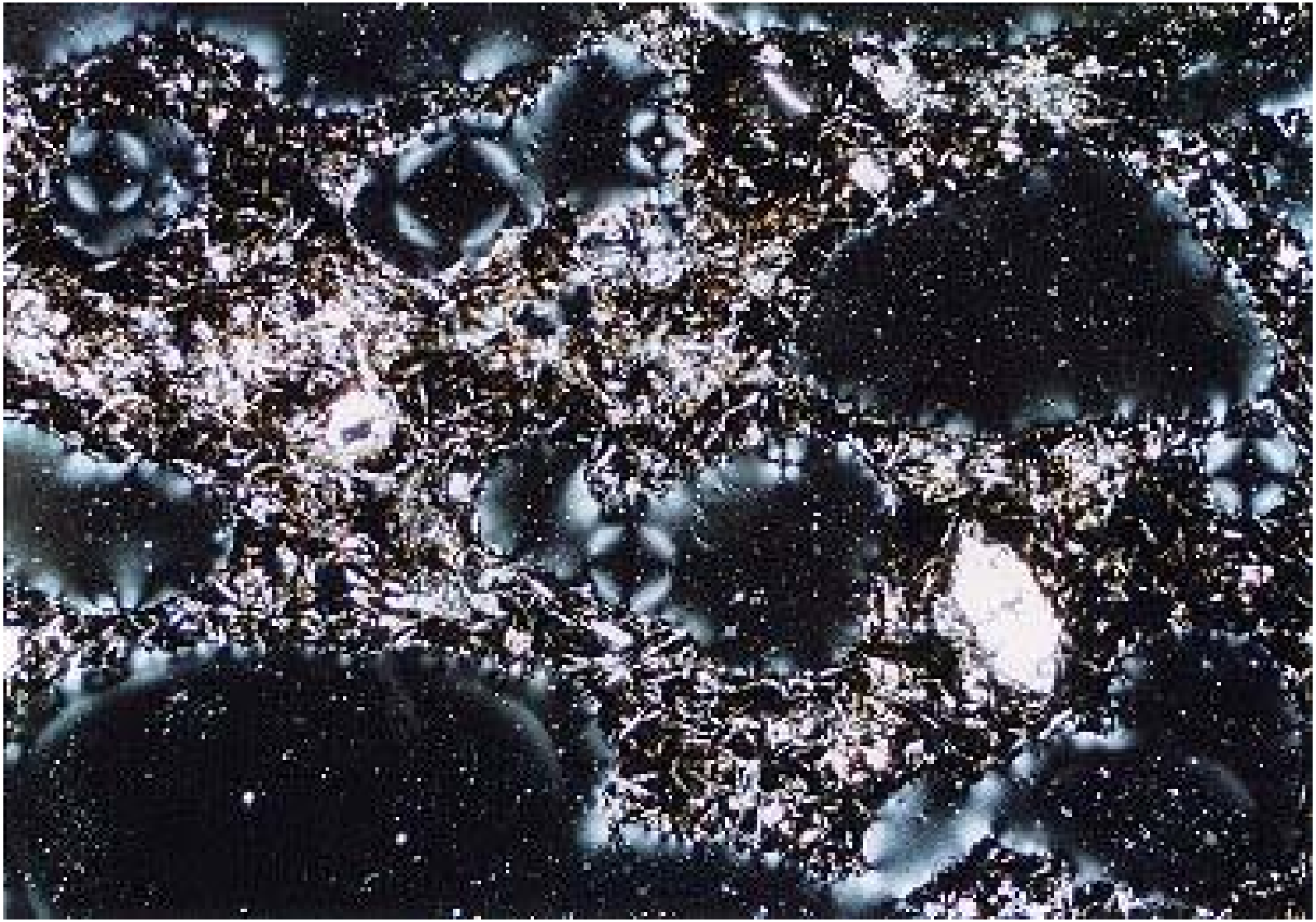
Sieve texture



Vesicles

- The black, ovals features in this scoriaceous basalt are vesicles. Note the acicular, white plagioclase laths throughout and the euhedral, white olivine phenocryst at the lower right.
- Want to see what happens to vesicles after some hydrothermal alteration?

Vesicles



Amygdaloidal texture

- The oval feature in this photomicrograph is an amygdule: a formerly open vesicle which has been filled with a secondary mineral(s) precipitated from low-T ground waters which have penetrated into the rock. In this case, the amygdule is probably filled with a zeolite mineral.

Amygdaloidal texture

Vitrophyre

- A Vitrophyre is another name for a phenocryst-bearing obsidian. The phenocrysts in the above photomicrograph are mostly plagioclase. The groundmass is obsidian glass. Can you think of some possible explanations to account for the extremely large difference in grain size in this rock?

Vitrophyre