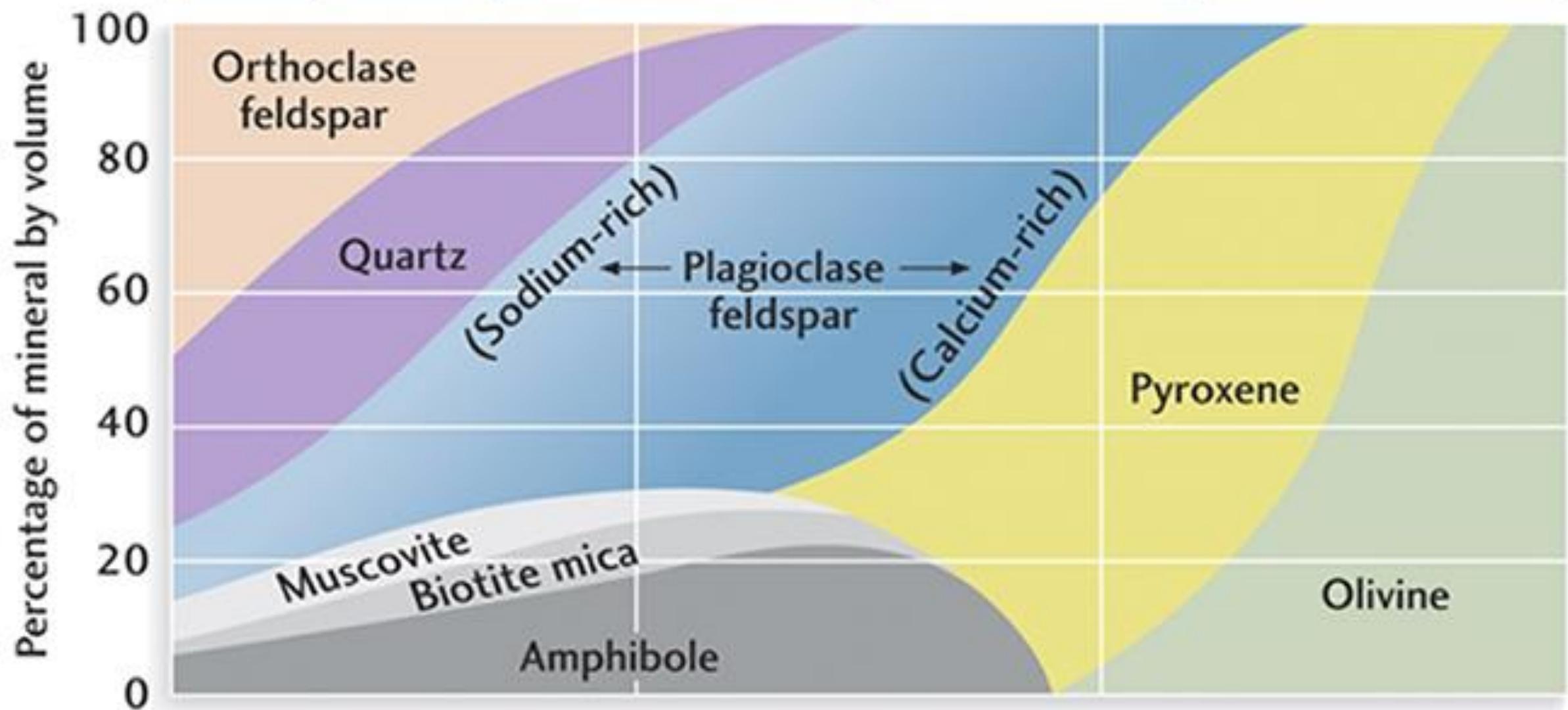


Composition	FELSIC	INTERMEDIATE	MAFIC	ULTRAMAFIC
Rock types	Granite Rhyolite	Diorite Andesite	Gabbro Basalt	Peridotite



**Fabric** refers to the mutual relationship between the grains.

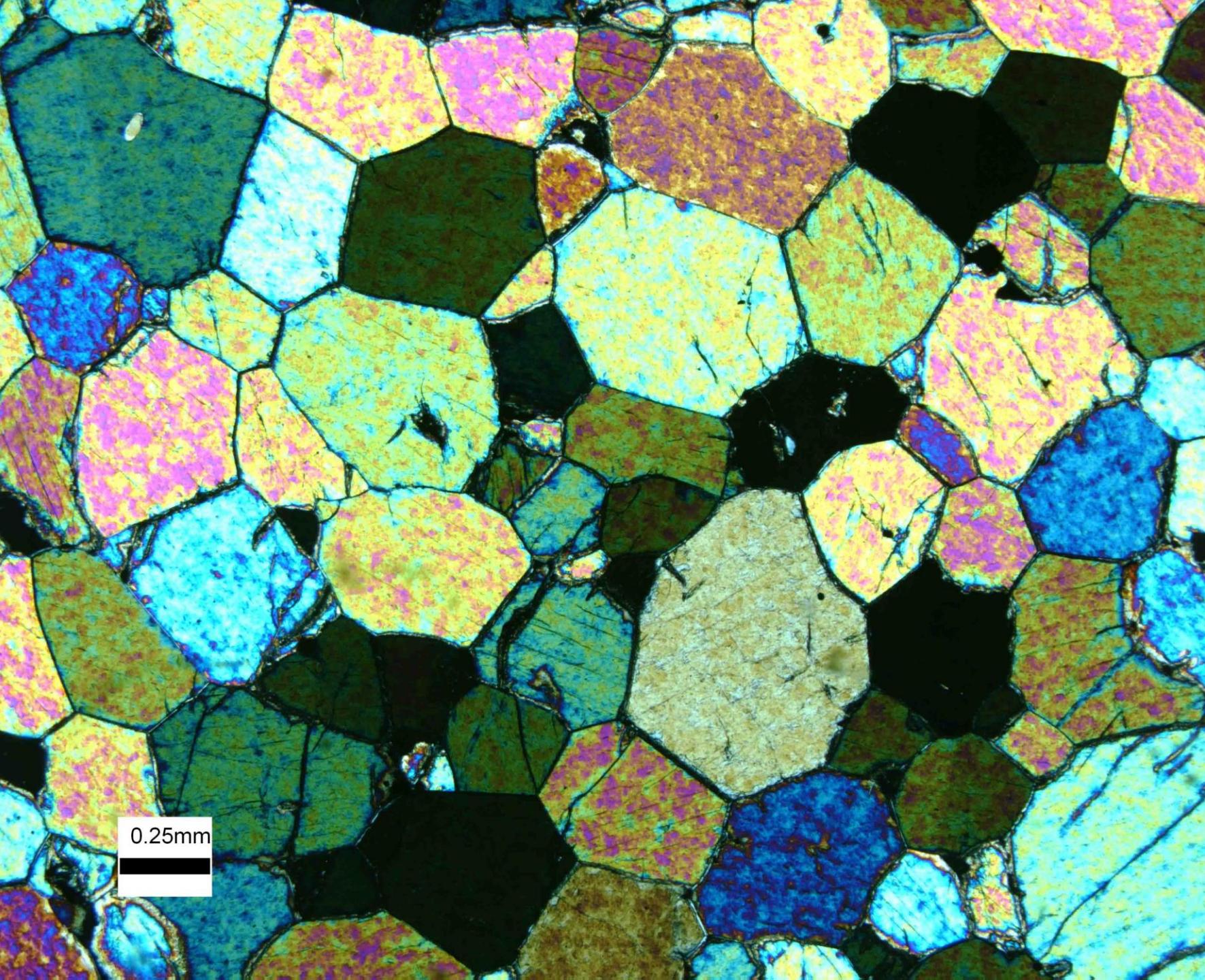
**Granular**: a rock texture resulting from the aggregation of mineral grains of approx. equal size.

Three types of fabric :

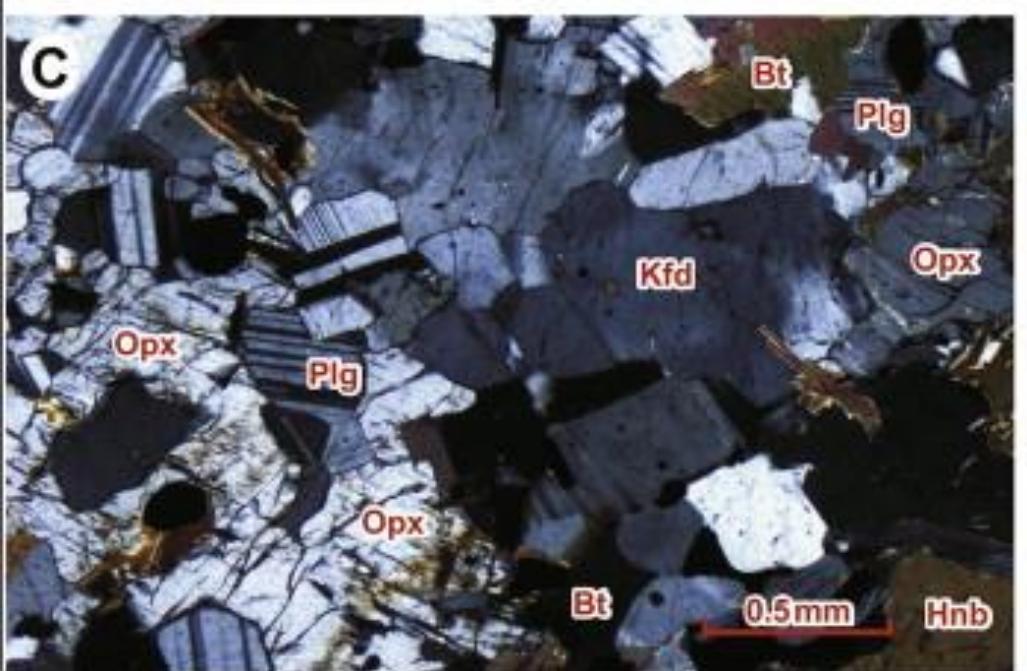
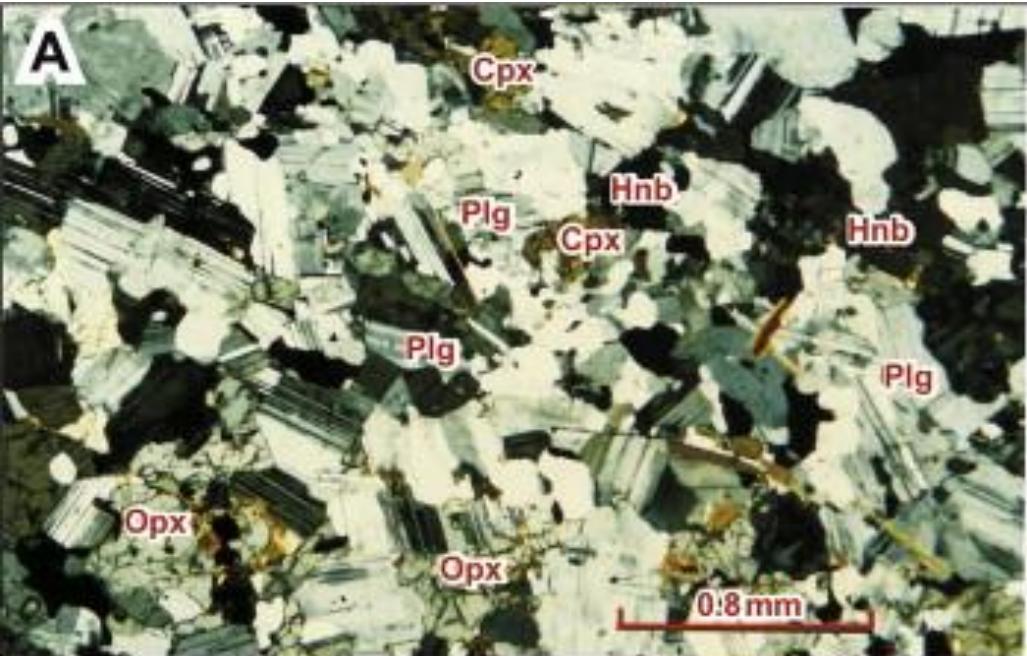
If most of the grains are euhedral, i.e. they are bounded by well-formed crystal faces: **idiomorphic granular**.

If most of the grains are subhedral, i.e. they are bounded by only a few well-formed crystal faces: **hypidiomorphic granular**.

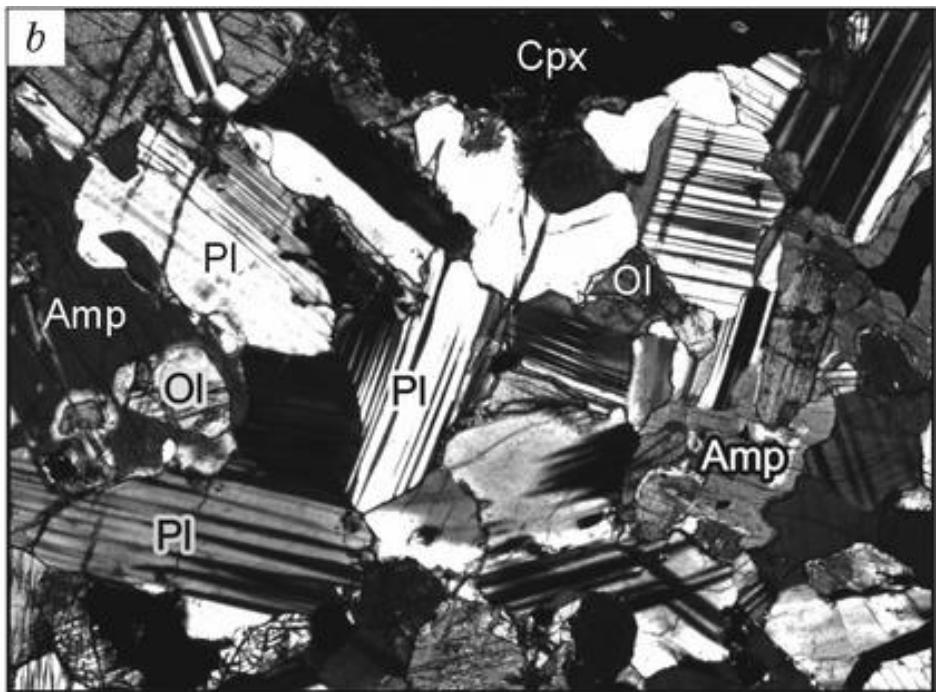
If most of the grains are anhedral, they are generally not bounded by crystal faces: **allotriomorphic granular**.



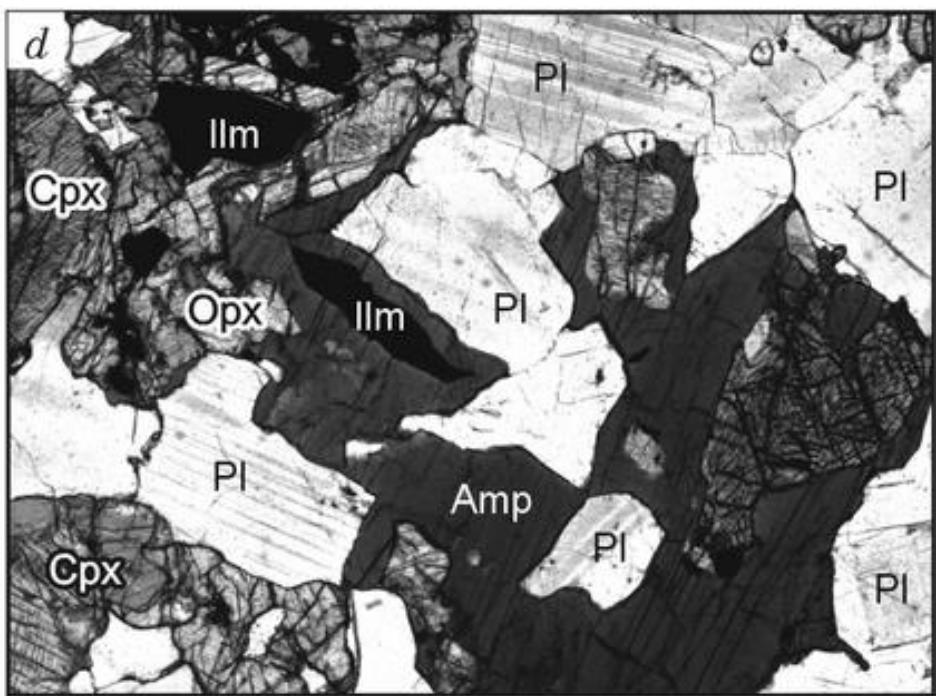
**idiomorphic granular  
Texture in dunite**



hypidiomorphic granular texture in granite



Allotrimorphic texture in gabbro



## Textures in Granitic rocks

**Graphic** - a texture consisting of intergrowths of quartz & alkali feldspar; resembles cuneiform writing.

Rocks containing abundant graphic textures – *granophyric* or *granophyre*.





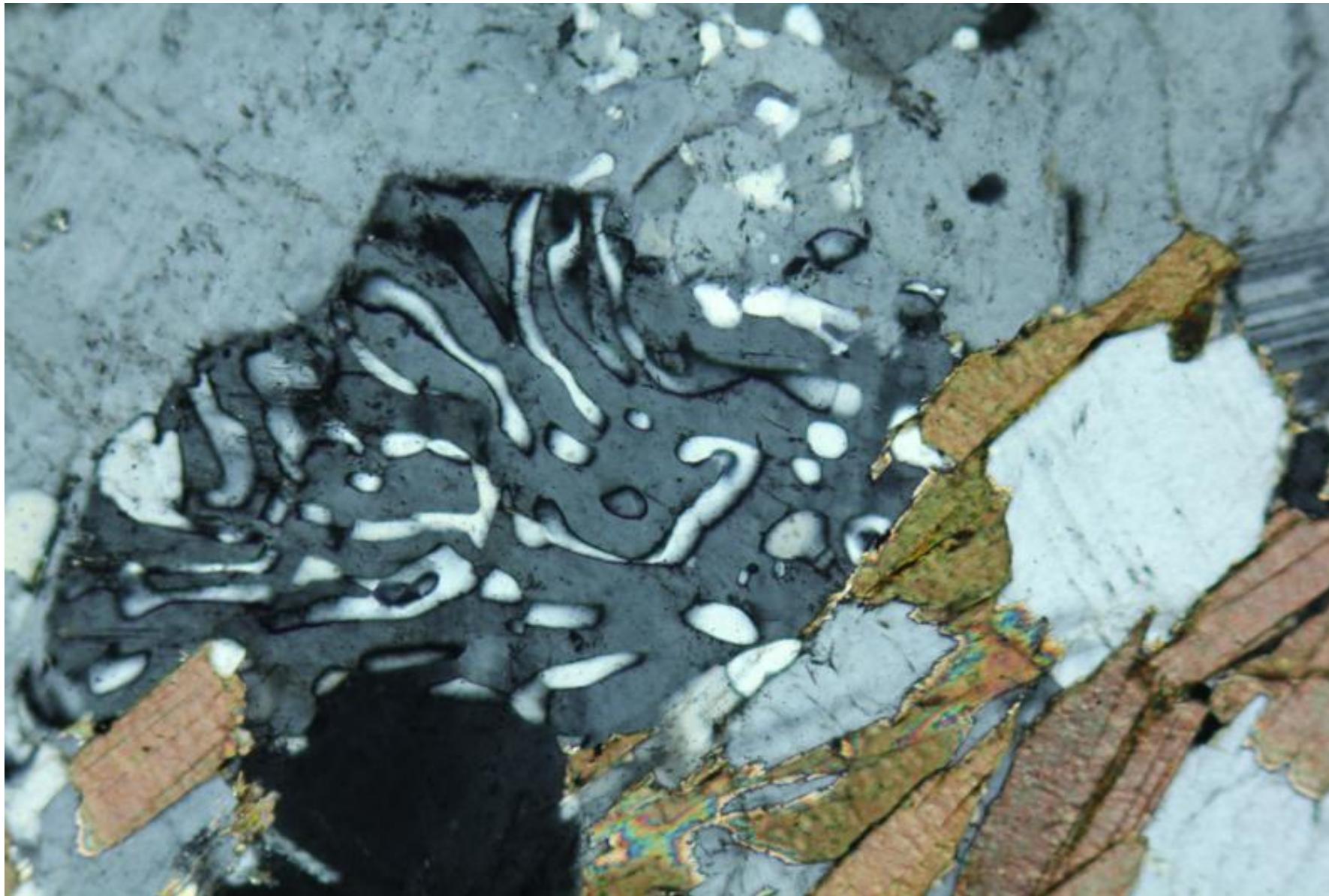
**Cuneiform** is a system of writing developed by the ancient Sumerians of Mesopotamia (Western Asia) c. 3500-3000 BCE.

A micrographic texture is a graphic intergrowth that can only be observed under the microscope.



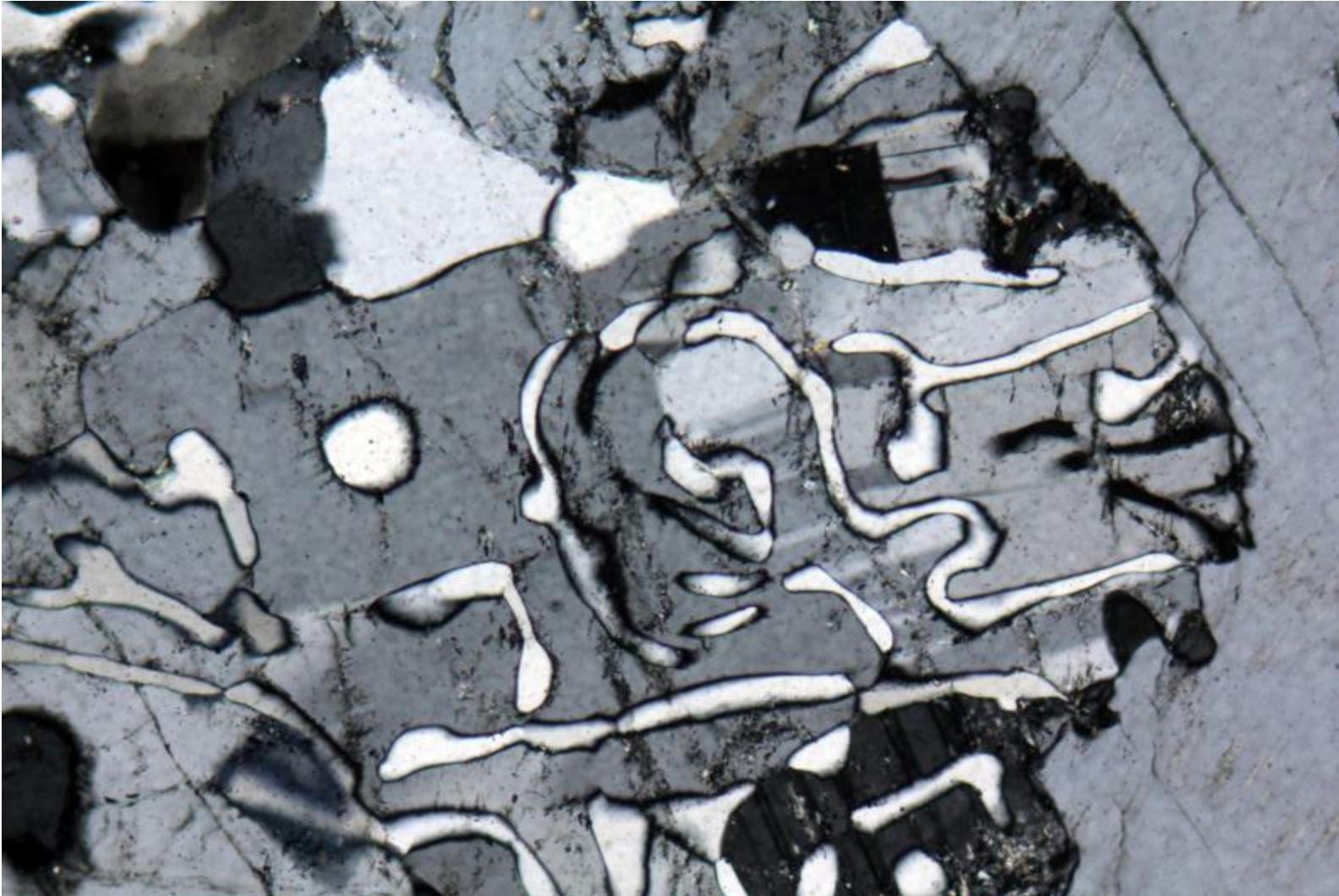
Graphic intergrowths of quartz in orthoclase. XPL image. Field of view = 2mm

Myrmekitic texture - an intergrowth of quartz and plagioclase that shows small wormlike bodies of quartz enclosed in plagioclase.



Myrmekite in  
plagioclase.  
XPL. Field of  
view = 2mm

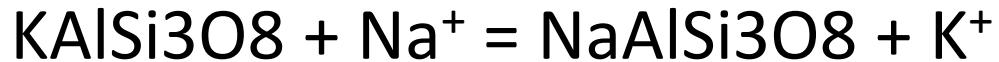
Myrmekite - intergrowth of branching rods of quartz set in a single crystal of plagioclase, neighbouring rods of quartz have the same crystal orientation & extinguish together.



Myrmekite in plagioclase.  
XPL, Field of view = 2mm

Origin of myrmekite is controversial.

One hypothesis proposed the reaction of Na- and Ca-bearing fluids with K-feldspar:



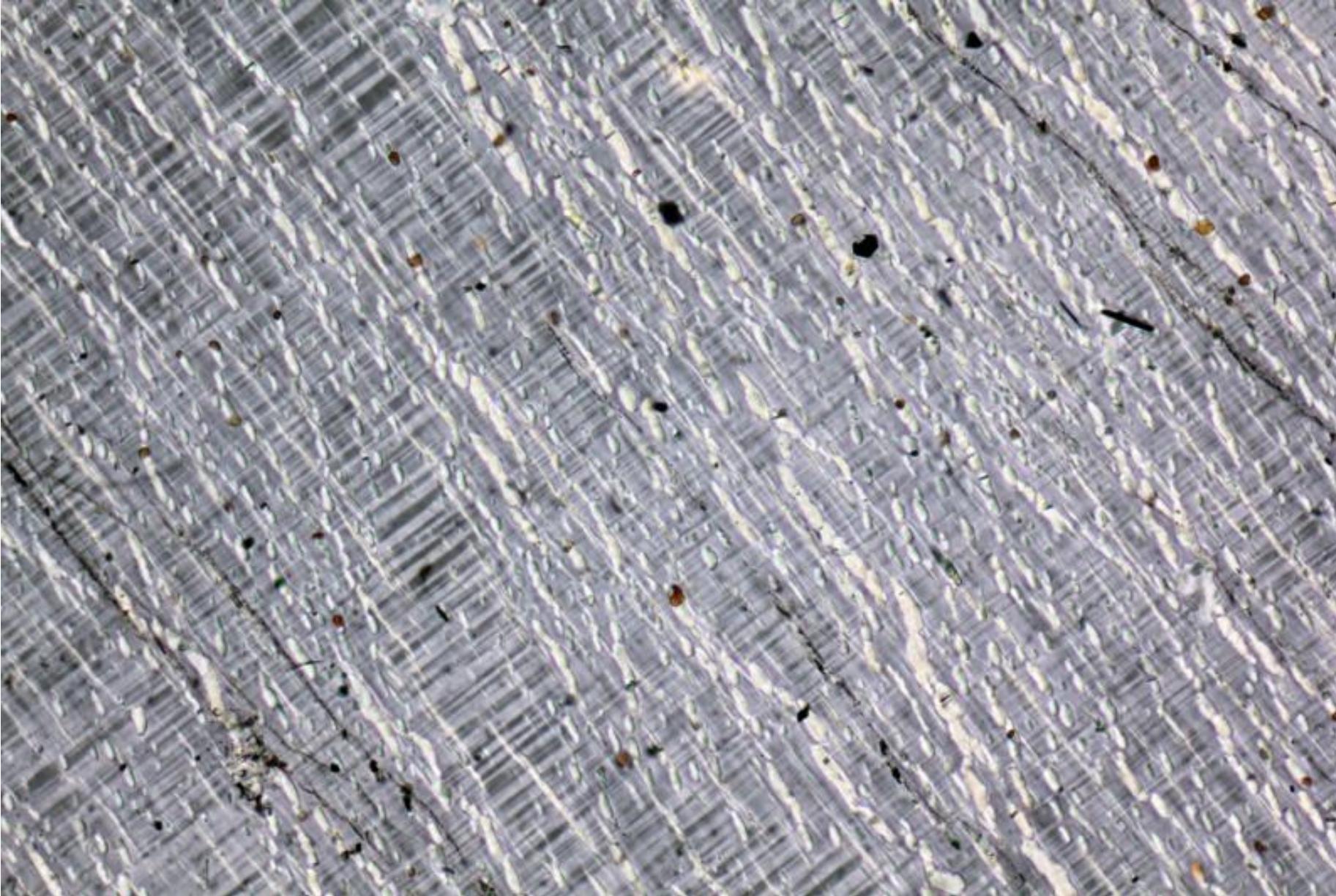
$\text{SiO}_2$  is released because the Al/Si ratio is different in K-feldspar and in Ca-rich feldspar and because of the immobility of Al and Si, quartz forms a microscopic intergrowth with feldspar.

Perthitic texture - Exsolution lamellae of albite occurring in K-feldspar



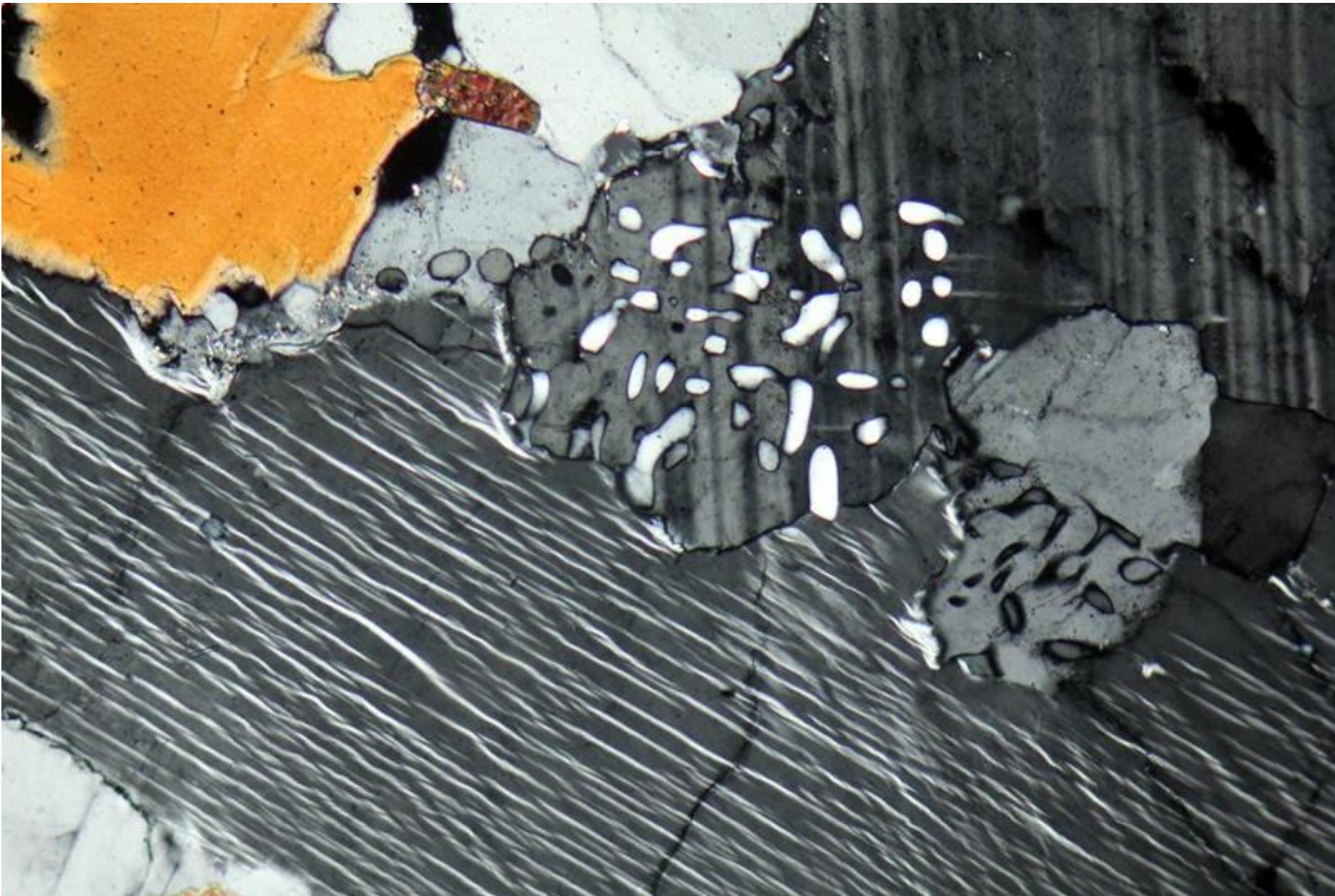
Perthite unmixing in microcline.

A perthite is an intimate intergrowth of sodic and potassic feldspar resulting from subsolidus exsolution (unmixing of two minerals).



Perthite unmixing in microcline. XPL, Field of view = 2mm

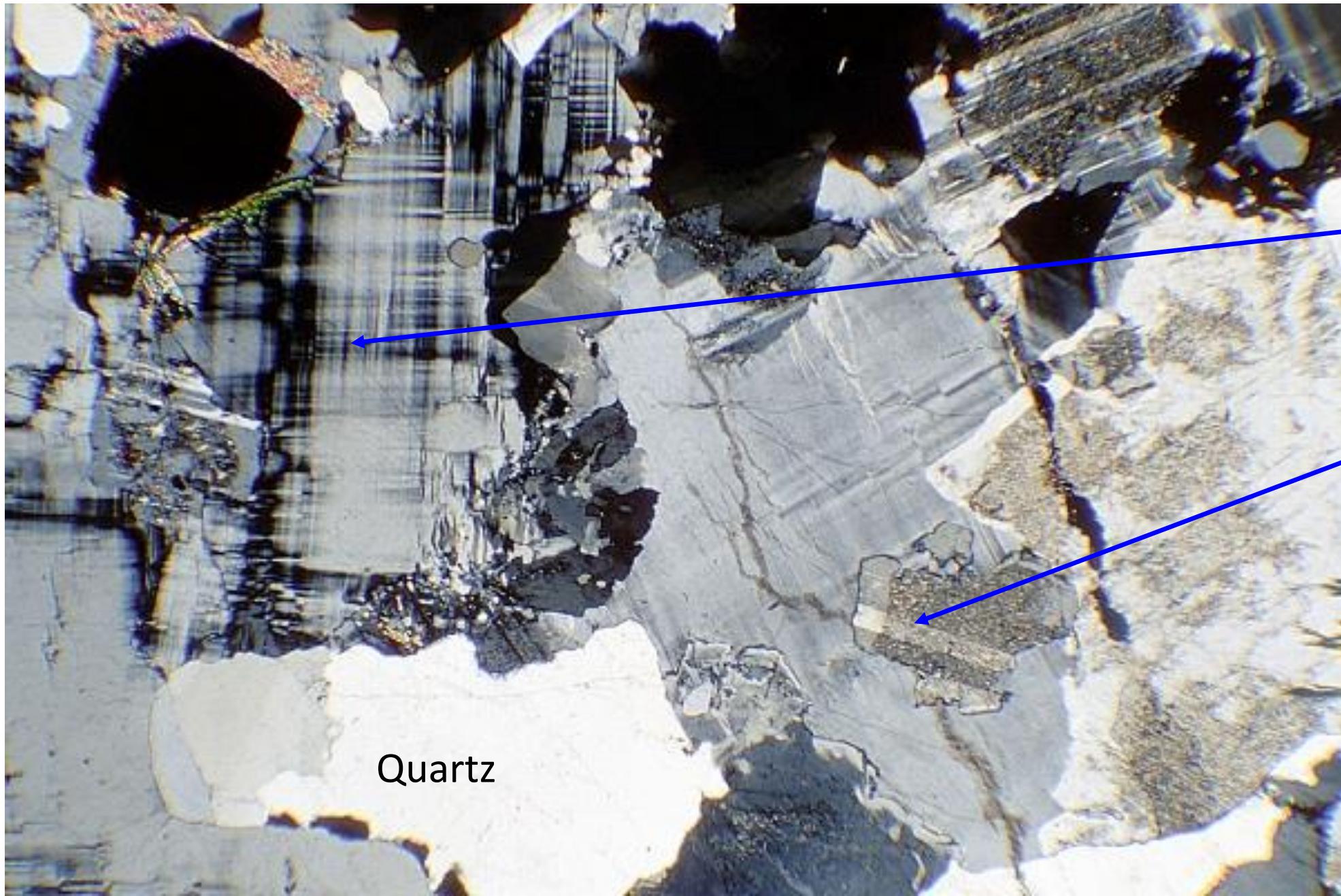
Perthite unmixing in orthoclase. XPL, Field of view = 2mm



## Granitoid rocks

Essential minerals: K-spar, Plag, Qz, ± Bt ± Hb ± Musc,

Accessory phases: Ap, Ttn, Zrn, IIm, Sill, Crd, Gt, Tm and Fluorite.



Quartz

Microcline

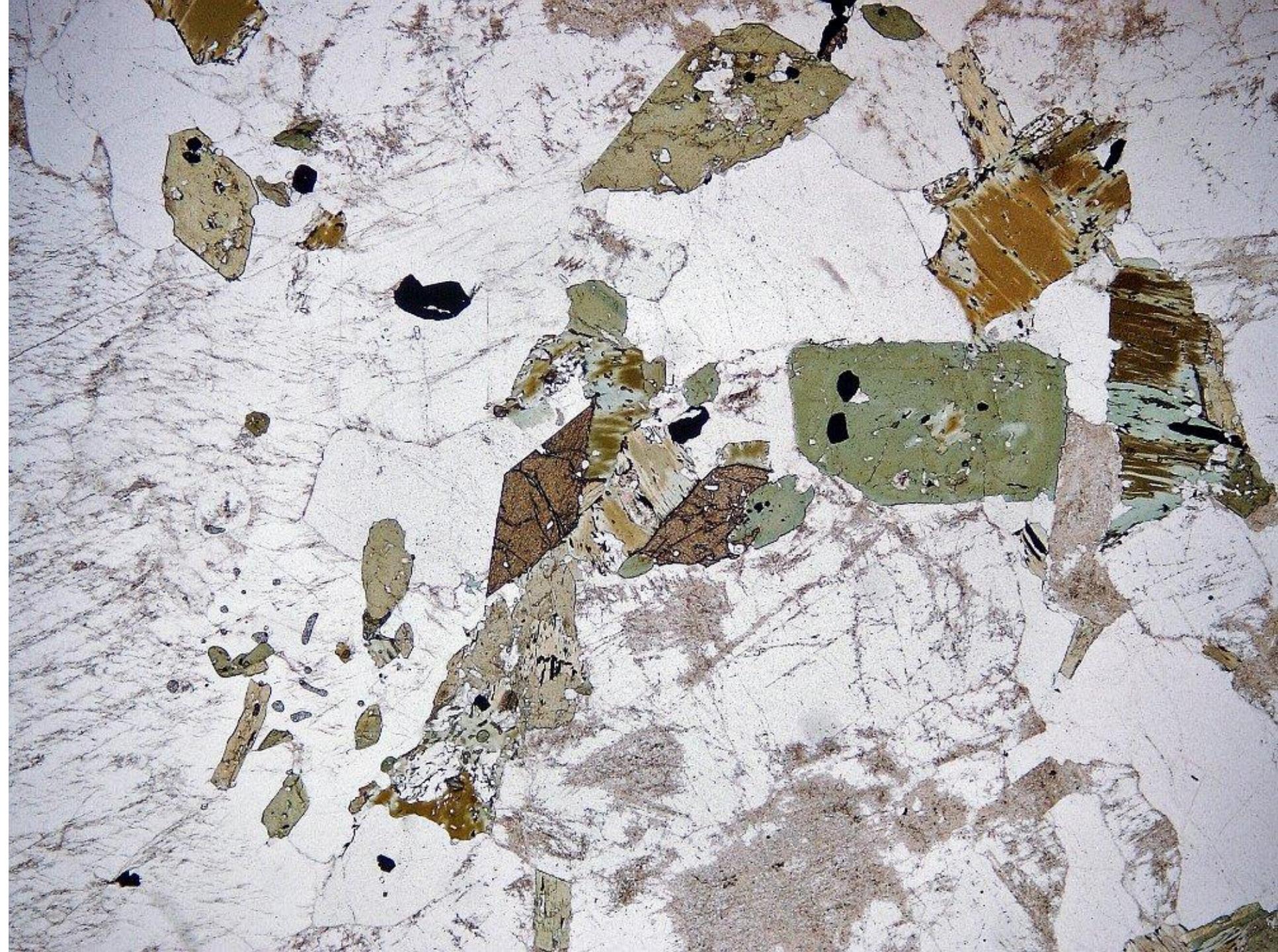
Plagioclase

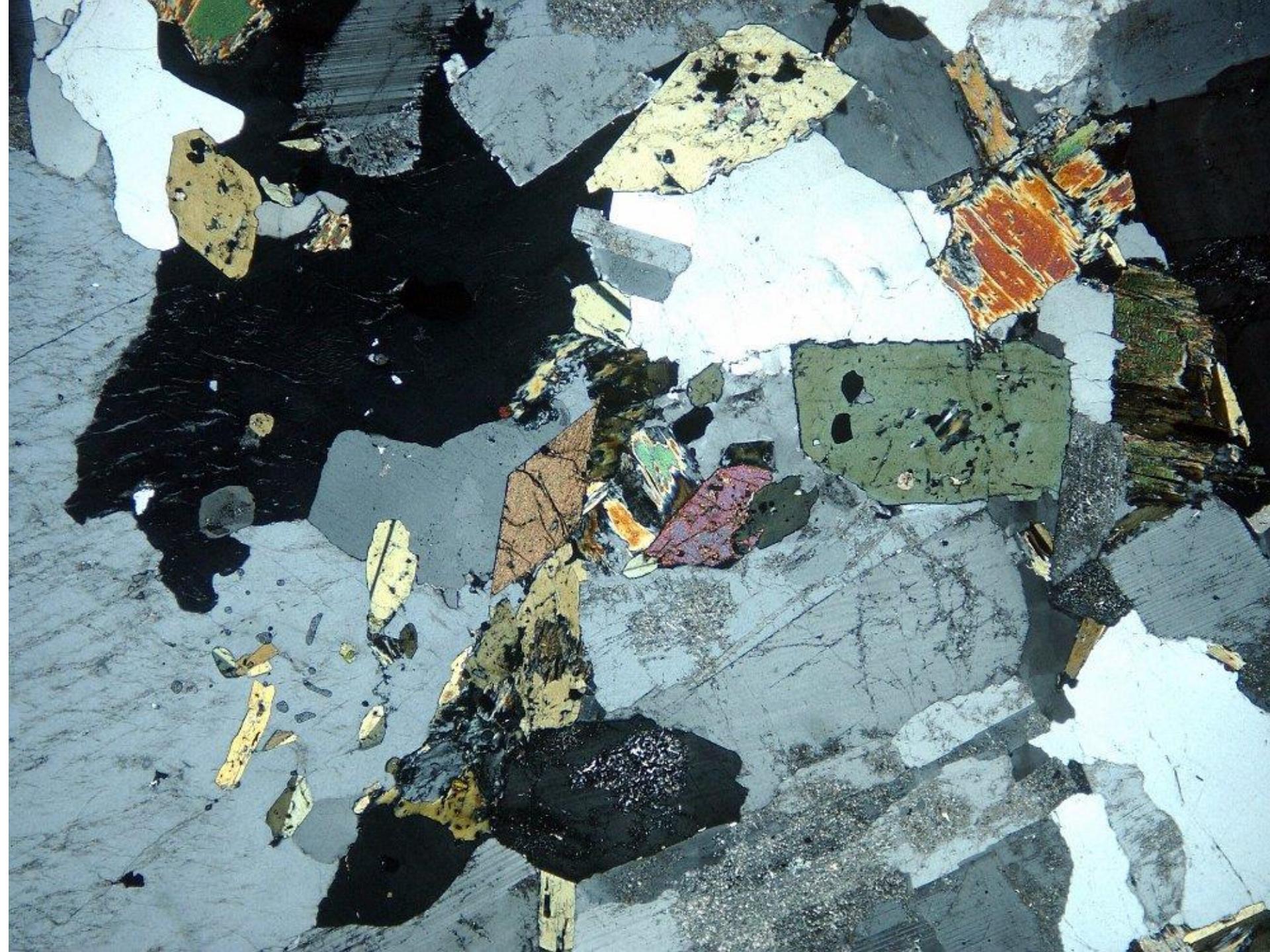
Granite XPL`



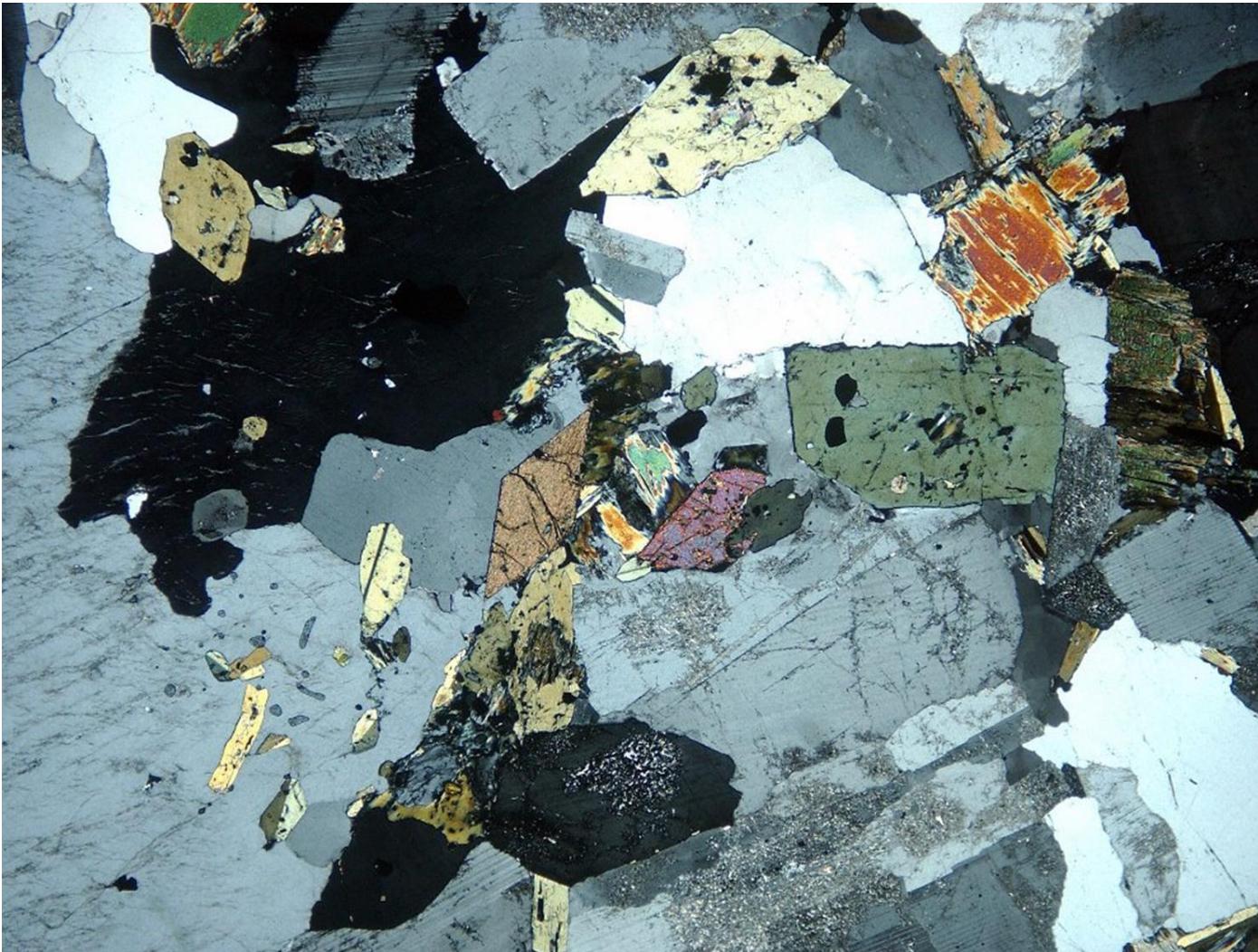




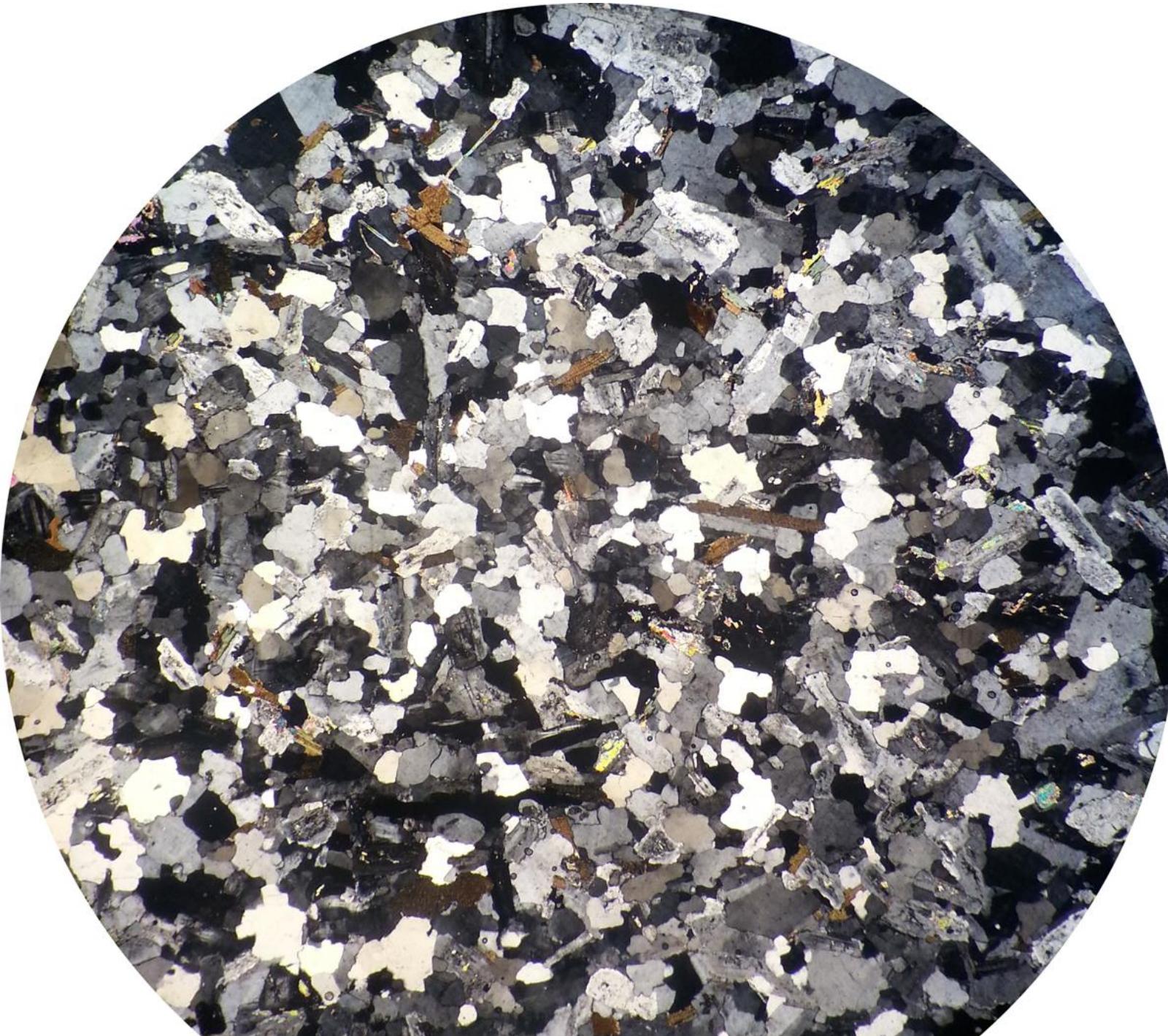




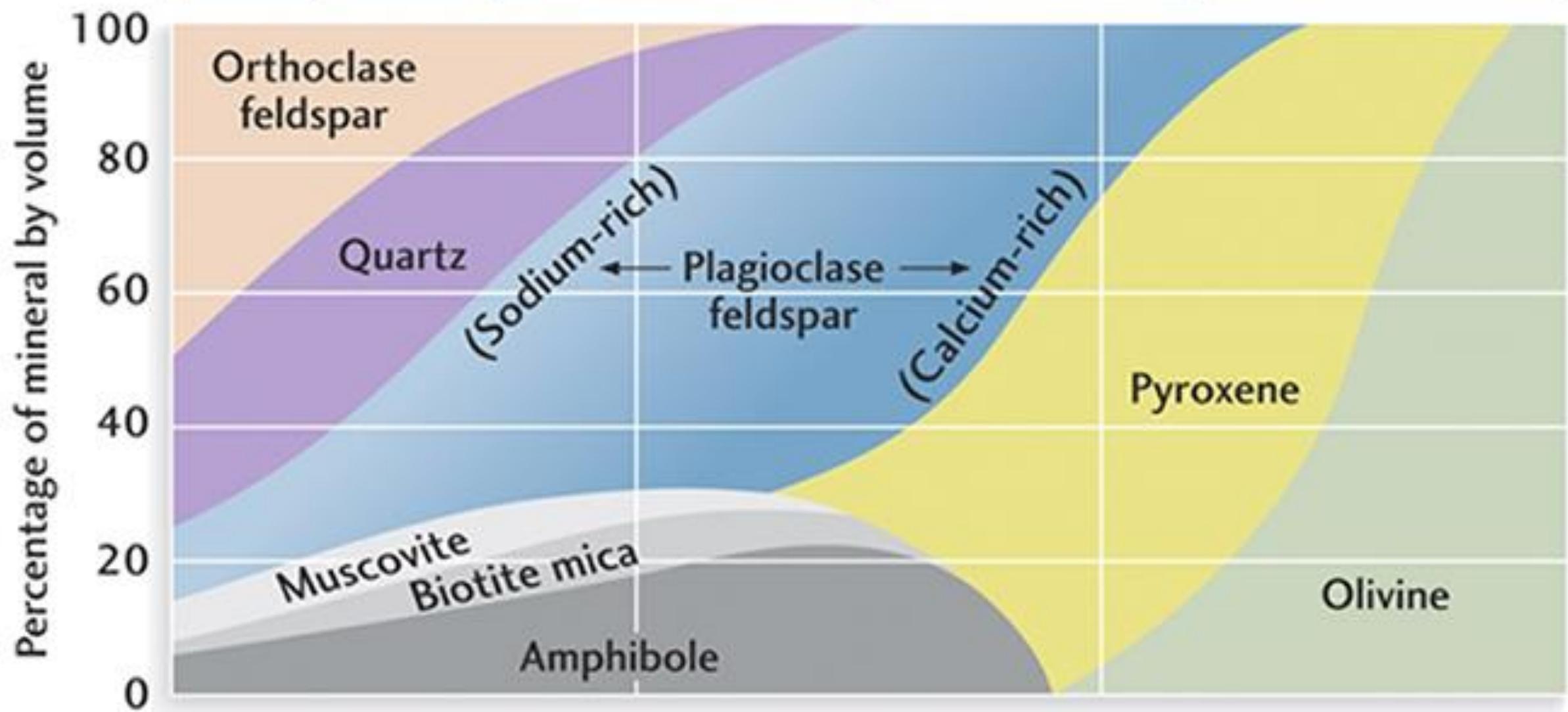
Hypidiomorphic texture: When most of the crystals are subhedral, the texture is called “hypidiomorphic”



Equigranular rock



Composition	FELSIC	INTERMEDIATE	MAFIC	ULTRAMAFIC
Rock types	Granite Rhyolite	Diorite Andesite	Gabbro Basalt	Peridotite





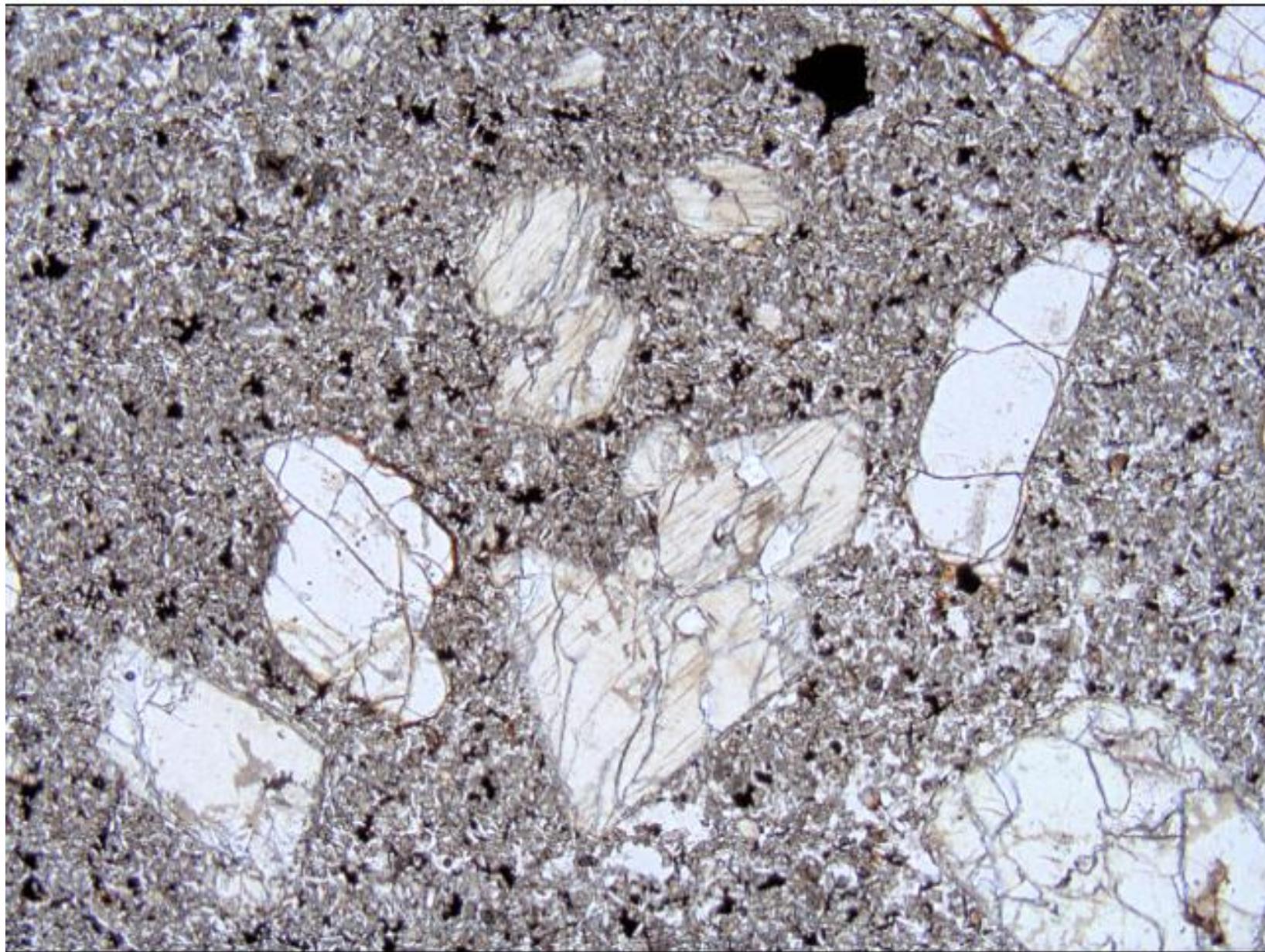
**Porphyritic texture**

**Phenocrysts** of olivine & pyroxene in microcrystalline basalt.

Phenocrysts are medium-grained, and euhedral to subhedral.

XPL

field width is 6 mm.



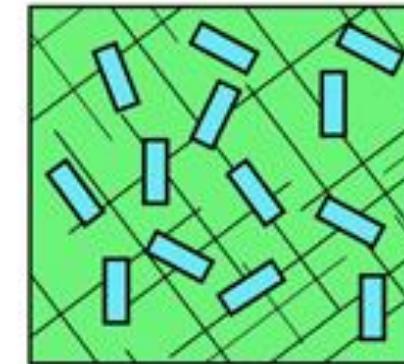
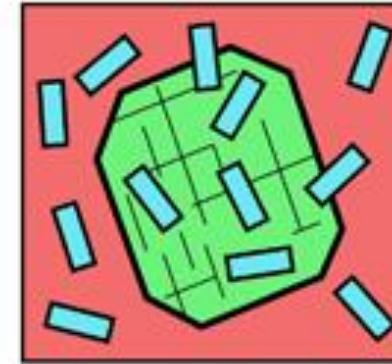
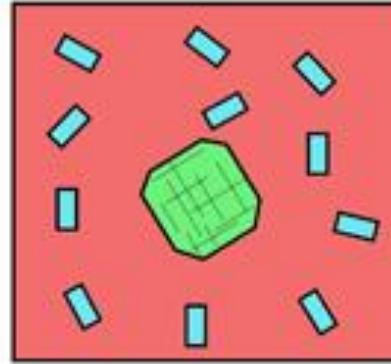
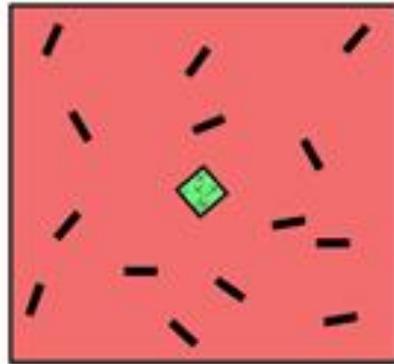
Porphyritic texture

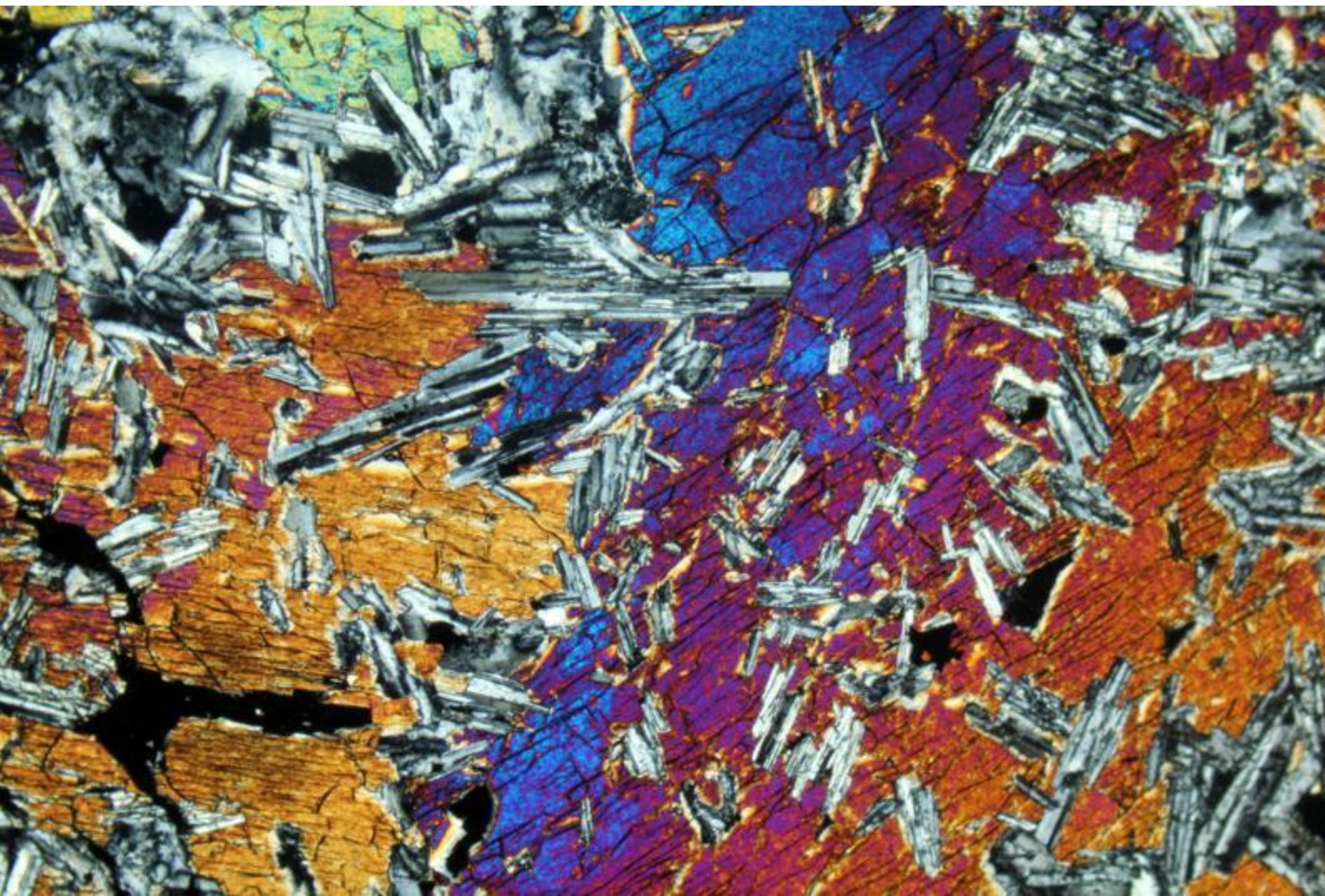
PPL

**Poikilitic texture** refers to crystals, typically phenocrysts, in an igneous rock which contain smaller grains of other minerals.

Poikilitic texture is widely used to determine order of crystallization.

if one mineral is enclosed by another then the enclosed grain must have been the first to crystallize.





Poikilitic texture

CPX Crystals with  
plagioclase  
inclusions.

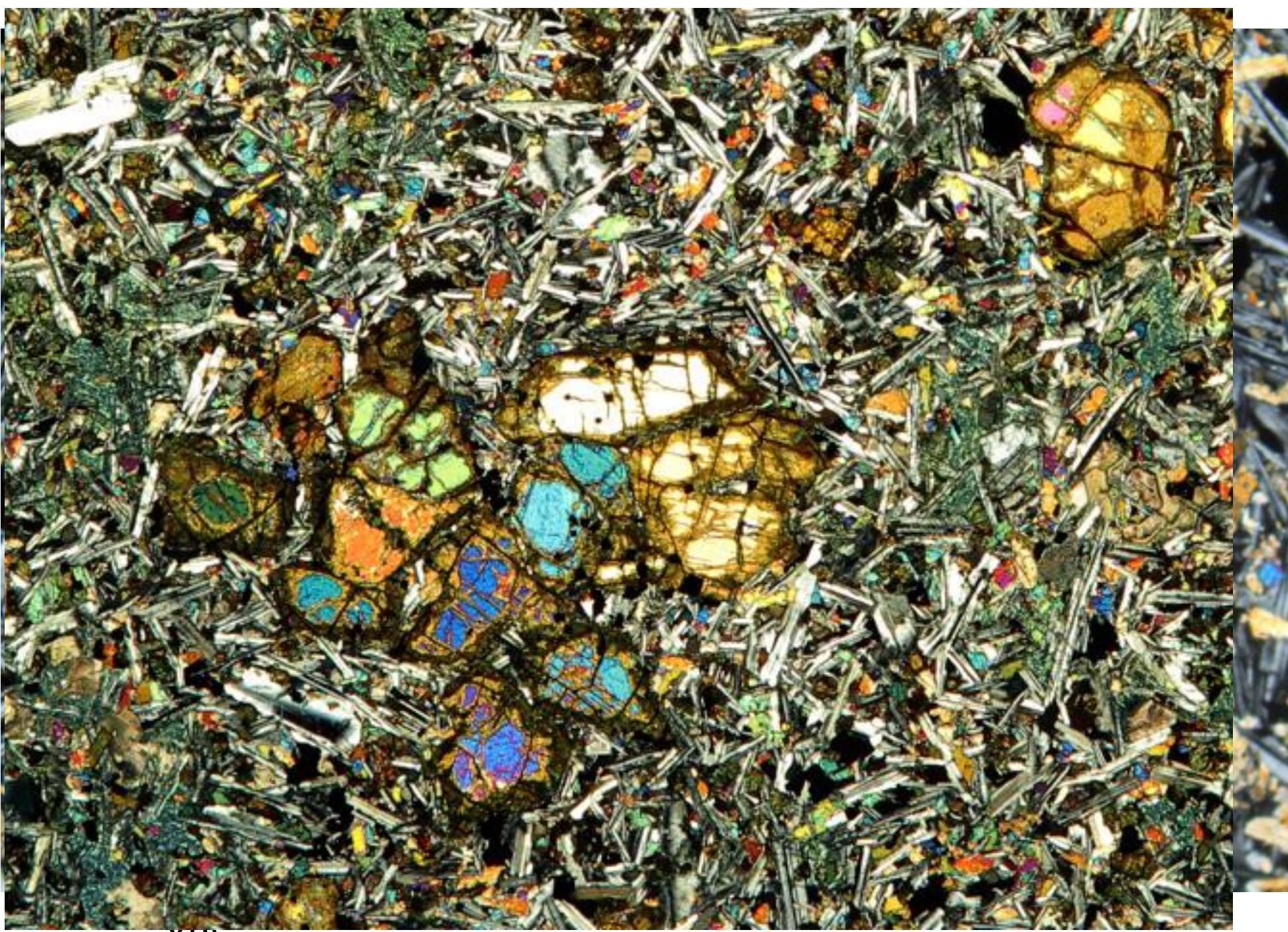
XPL



Sub-ophitic  
Texture

Partial  
enclosure of  
plagioclase

XPL



XPL

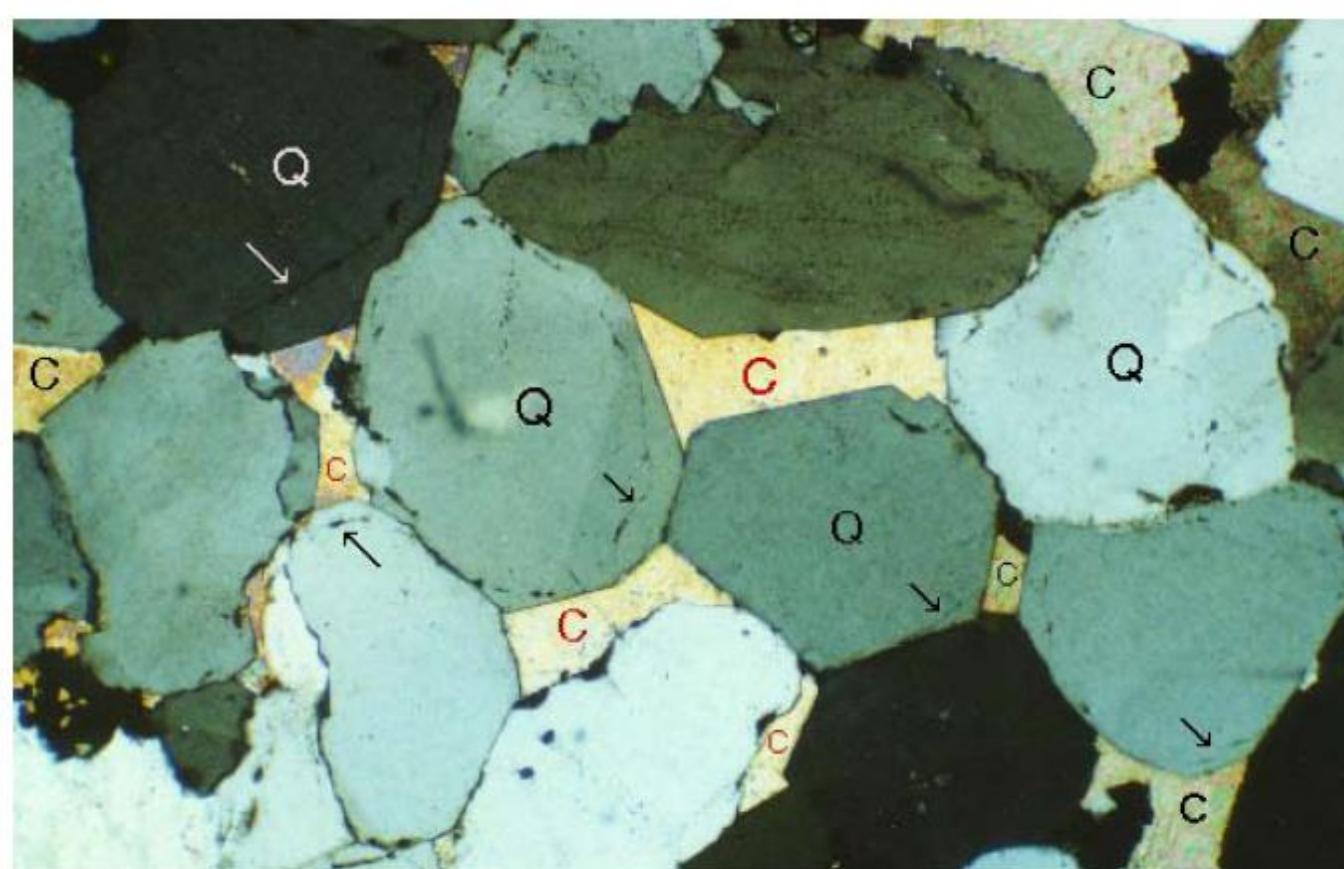
**Intergranular  
Texture indicating**  
crystals occupying  
angular space  
between at least two  
larger crystals.

Intergranular crystals  
have crystallised  
later.

A common case of  
Intergranular texture  
-space between  
plagioclase crystals  
occupied by granules  
of pyroxene ( $\pm$   
olivine and opaque  
oxides).

# Sandstones

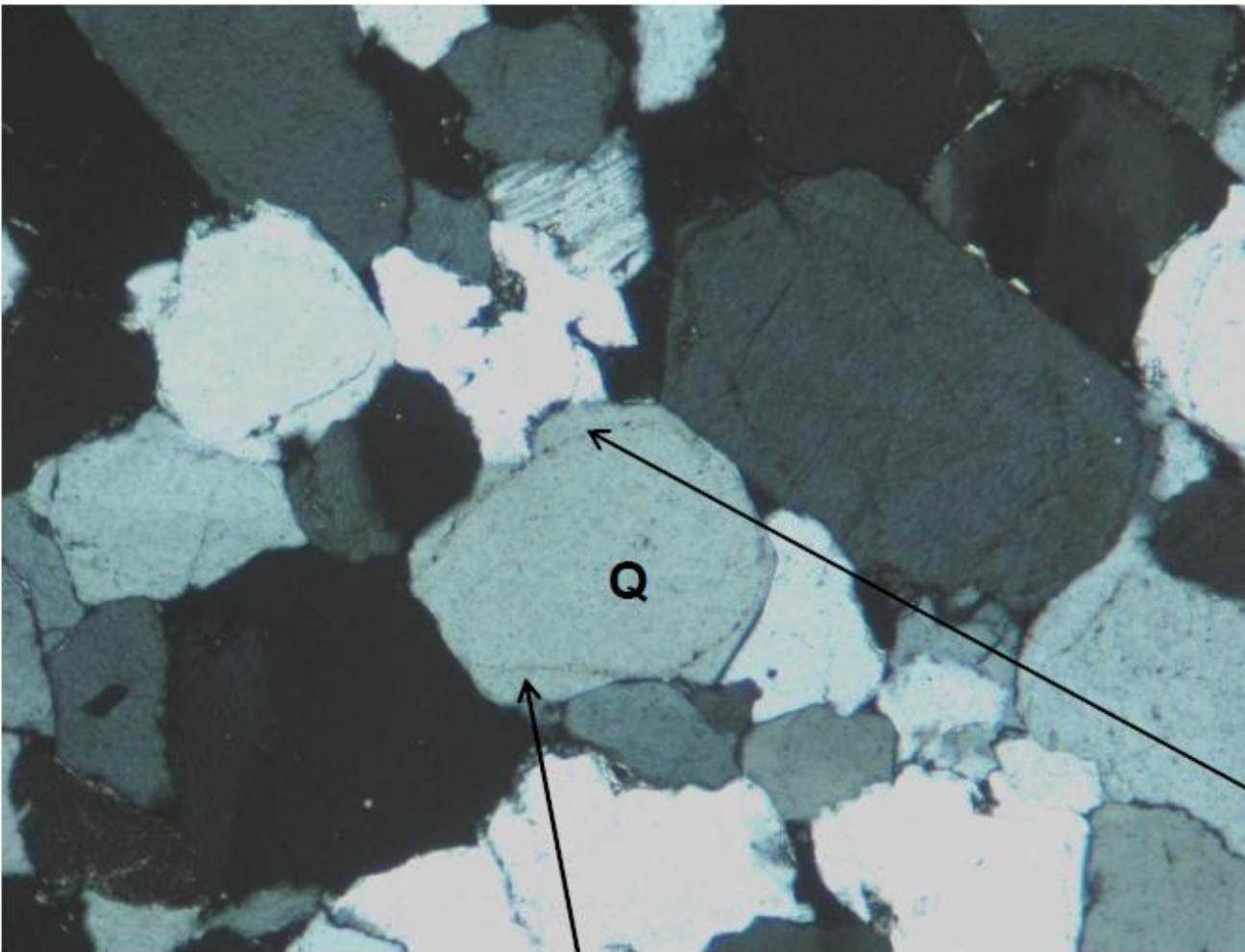
**Calcite + silica  
-cemented  
quartz arenite**



- Well-rounded & well-sorted quartz grains (Q).
- Euhedral quartz overgrowths (arrows) in optical continuity. Note the dust rings.
- Calcite (C) has filled remaining pore space. One calcite nucleation.

X-nicols;  
Field of view 2.3 mm wide.

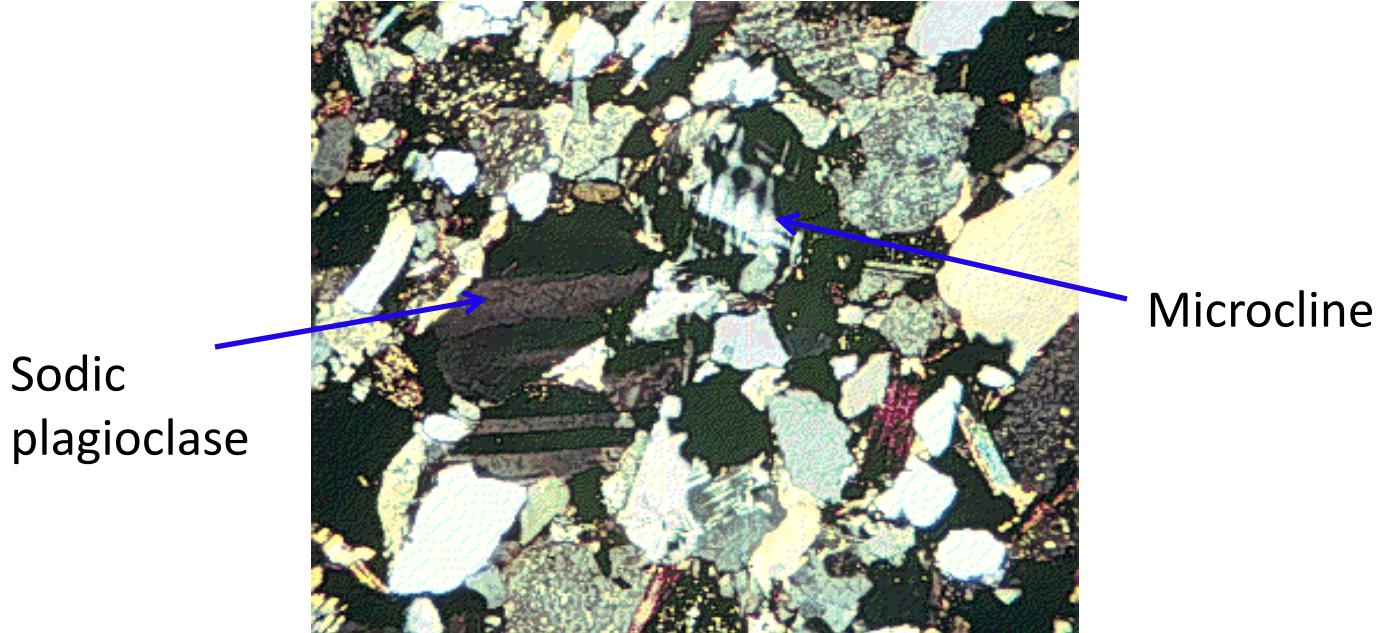
**Silica-cemented  
quartz arenite**



**Well-rounded quartz grains**

Silica-cement

Dust-ring

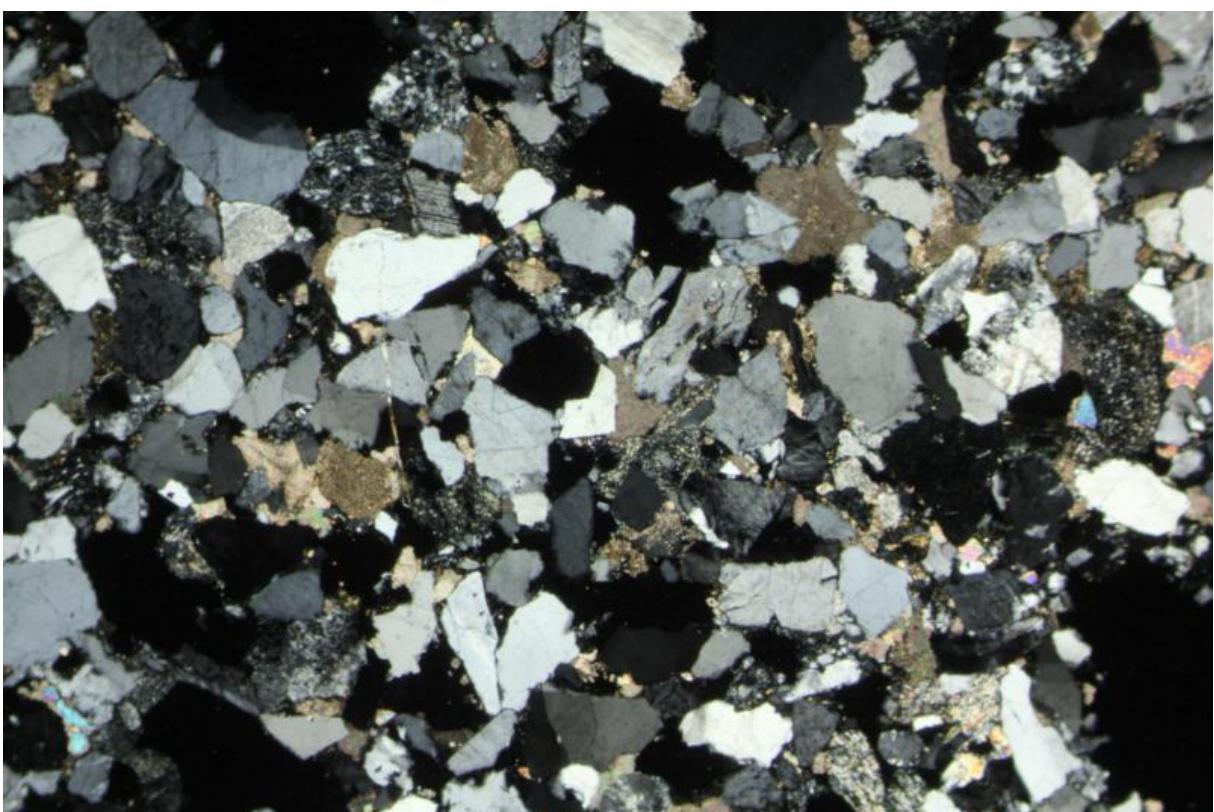


**Arkose** showing abundant sodic plagioclase (multiple twins, partially altered to clays) and microcline (basketweave twins).



**Arkose from Kaladgi basin**





# Metamorphic rocks: Mica schist





