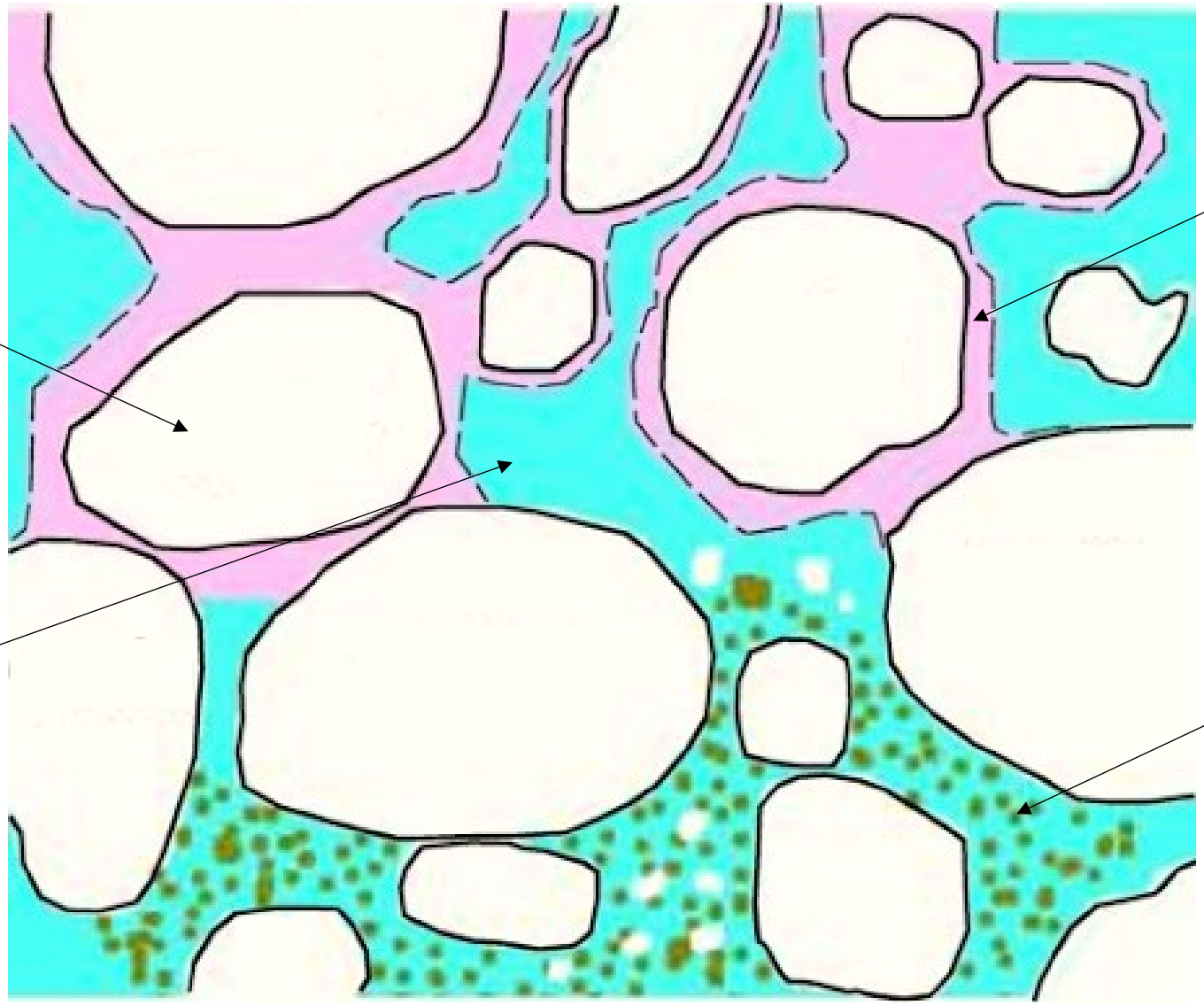
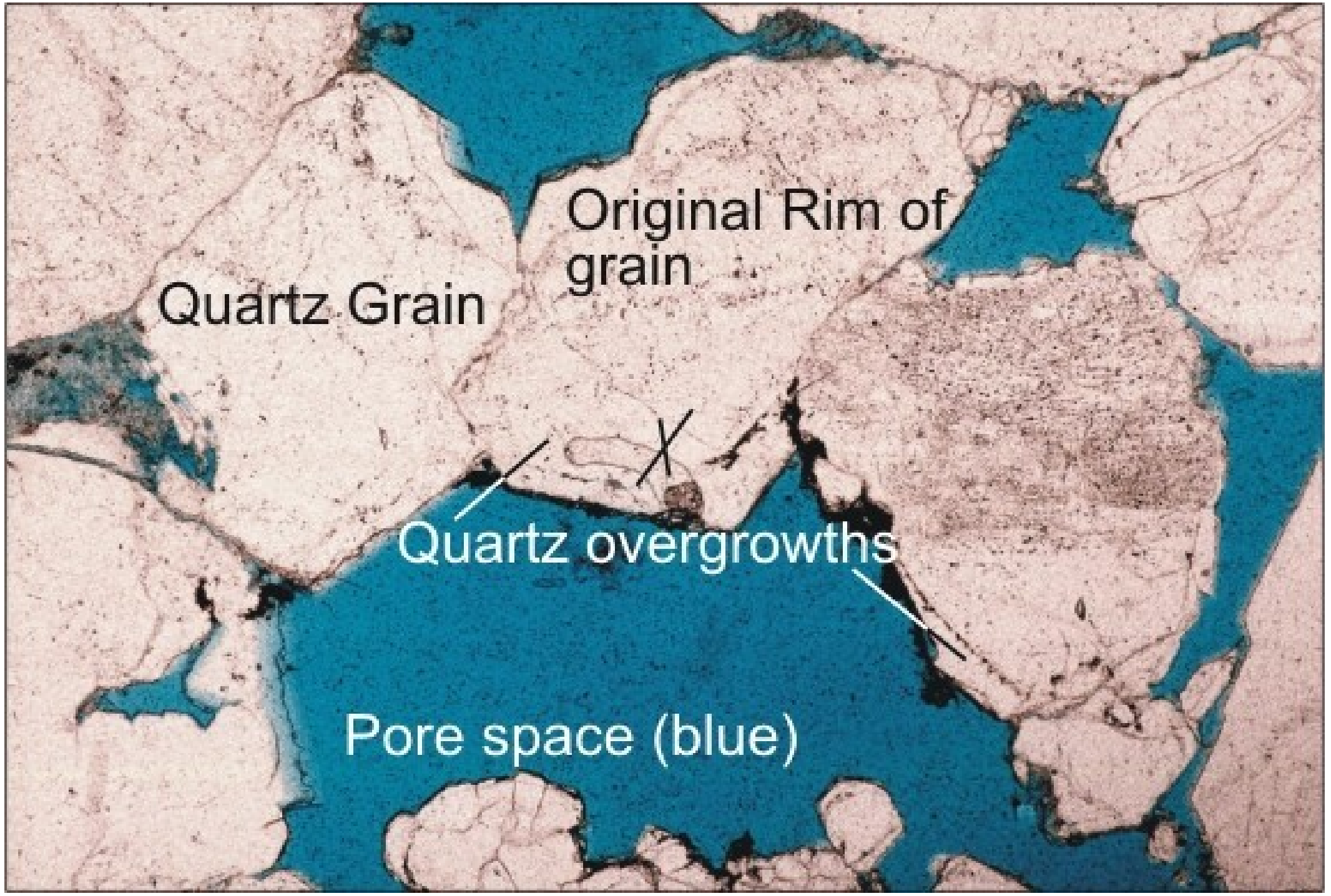
Diagênese

“Porosidade”

Arcabouço, matriz, cimento e poro

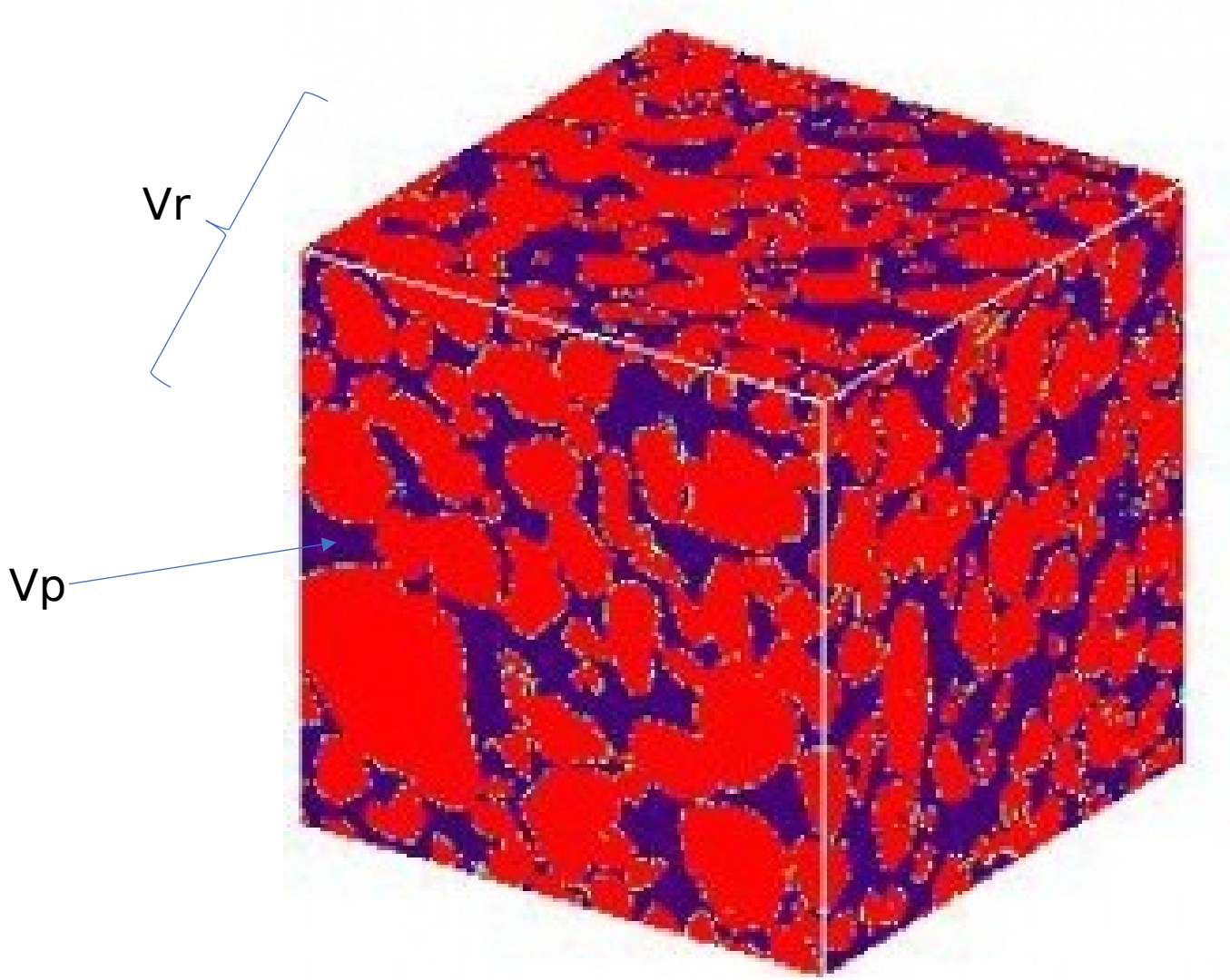
Arenito Berea



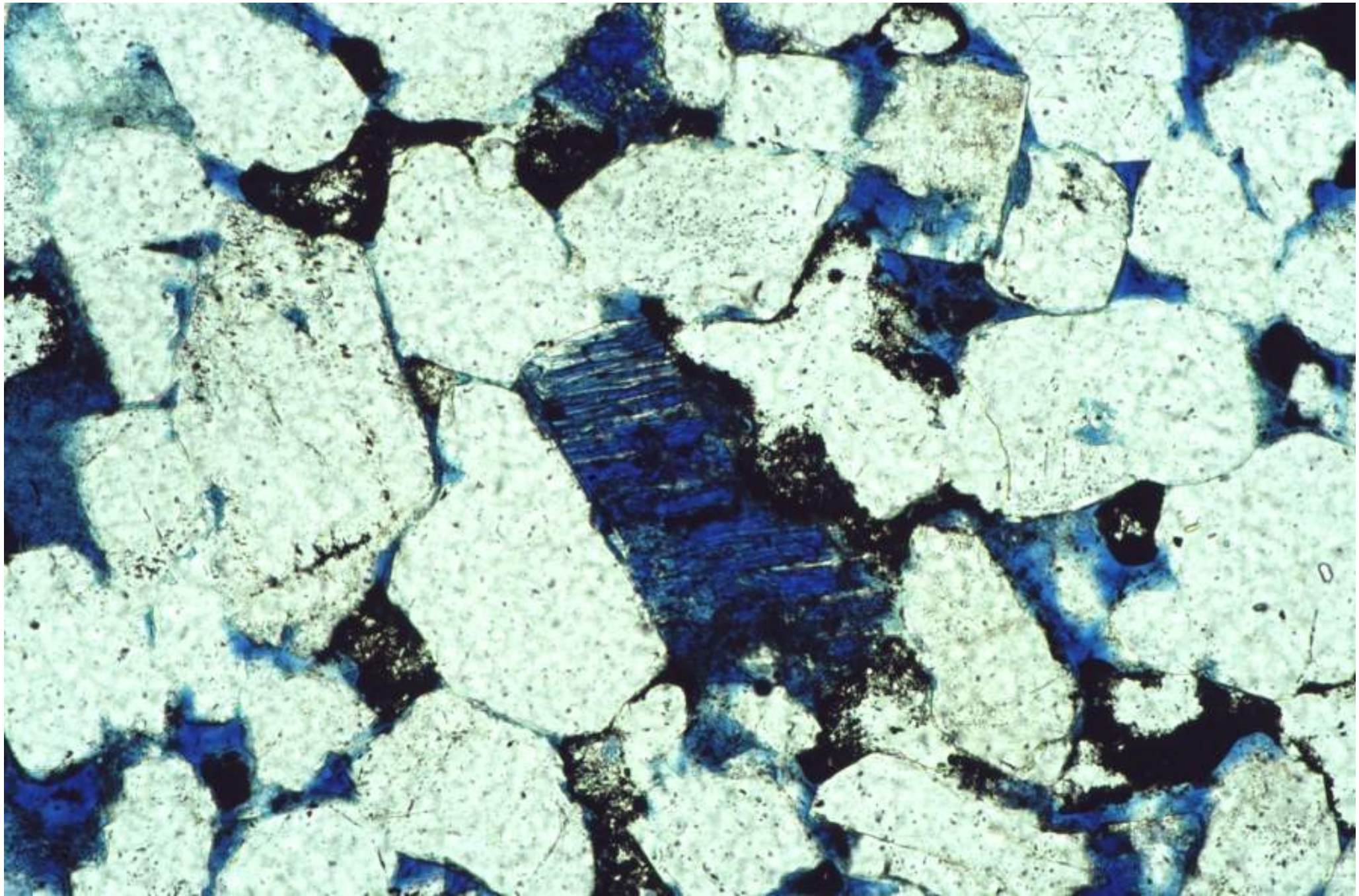

Original Rim of grain
Quartz Grain
Quartz overgrowths
Pore space (blue)

Definição e unidade de medida

- Porosidade (Ø)
- Unidade: %

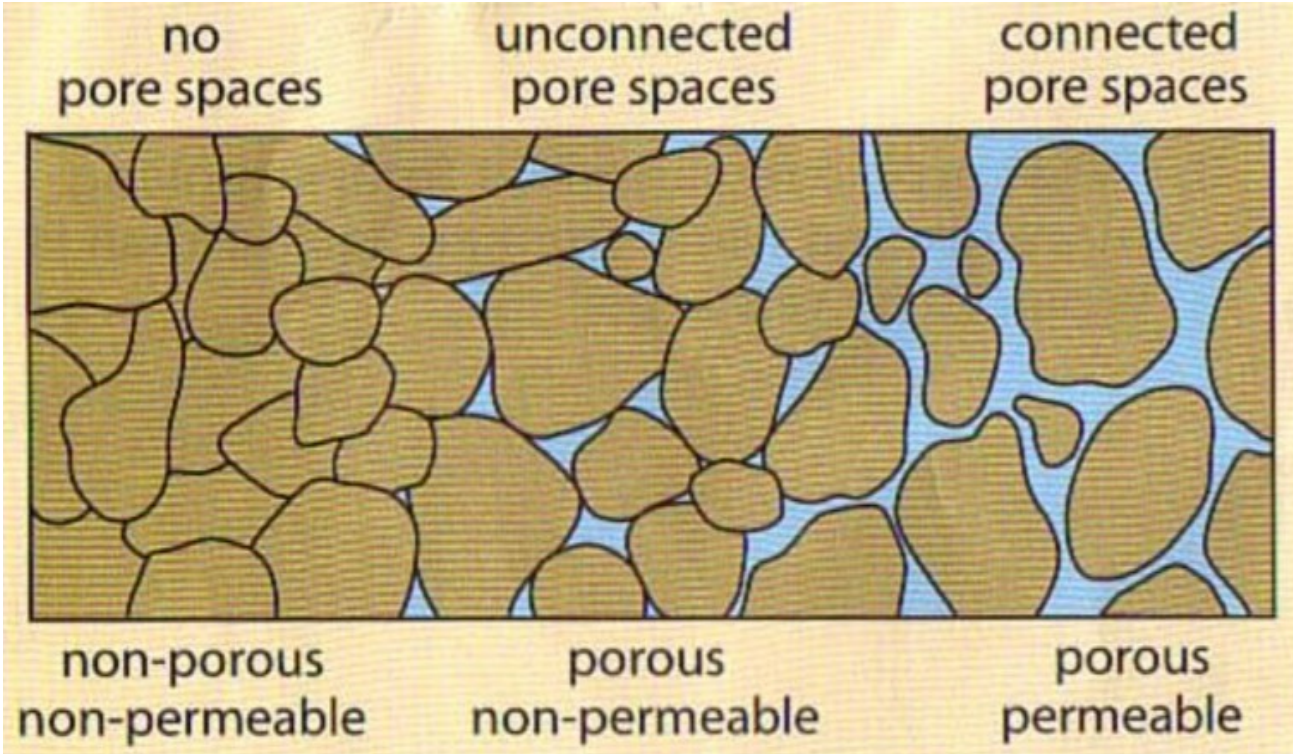


Porosidade primária e secundária



Permeabilidade (K): capacidade em transmitir um determinado fluido

Unidade: Md (milidarcy)



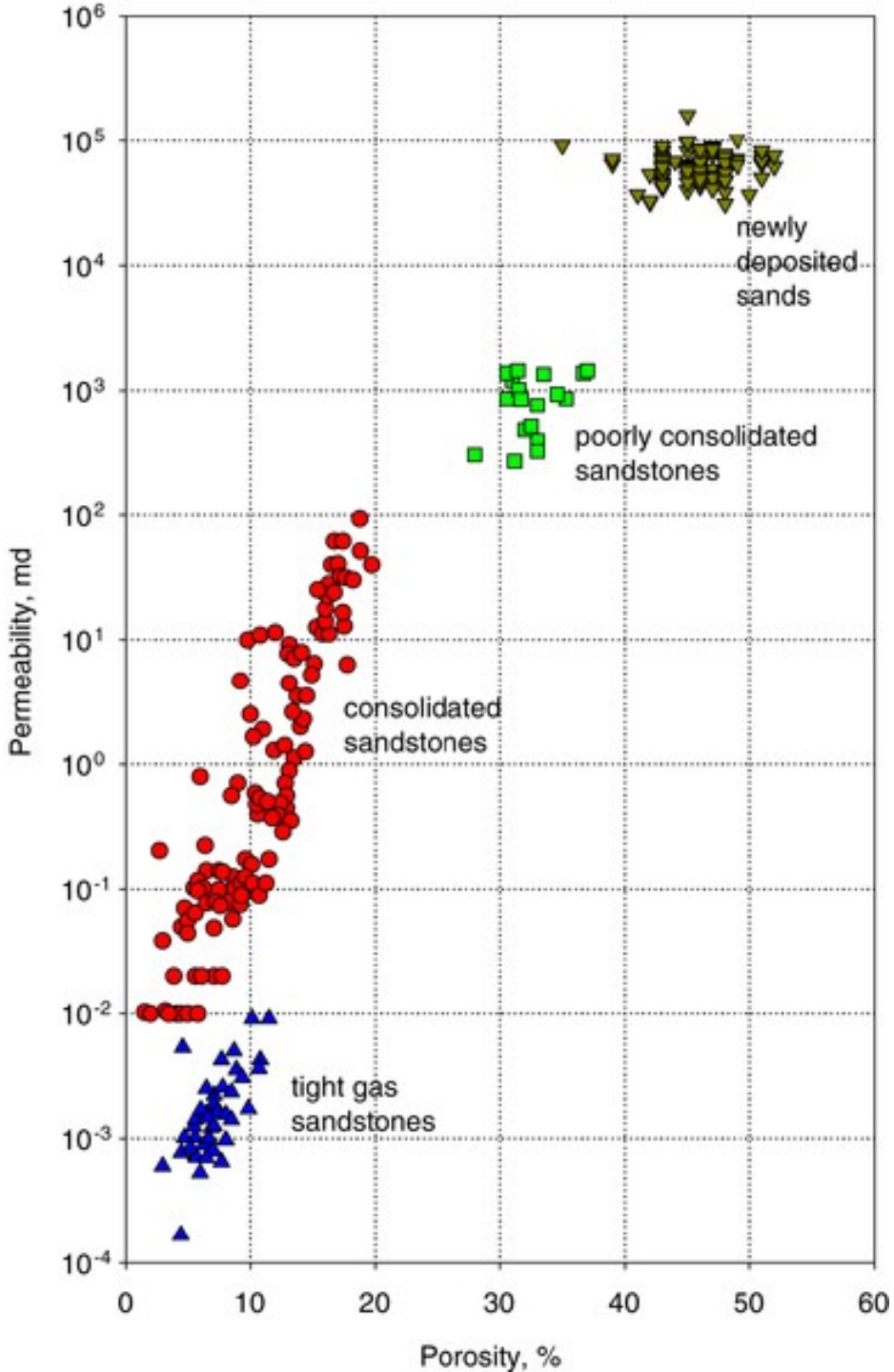
UC Denver

Porosidade (ø) e permeabilidade (K) de reservatórios de petróleo

ø	
0-5%	Insignificante
5-10%	Ruim
10-15%	Razoável
15-20%	Bom
>20%	Excelente

K	
1.0 to 15 mD	Baixa
15 to 50 mD	Moderada
50 to 250 mD	Boa
250 to 1000 mD	Muito boa
> 1000 mD	Excelente

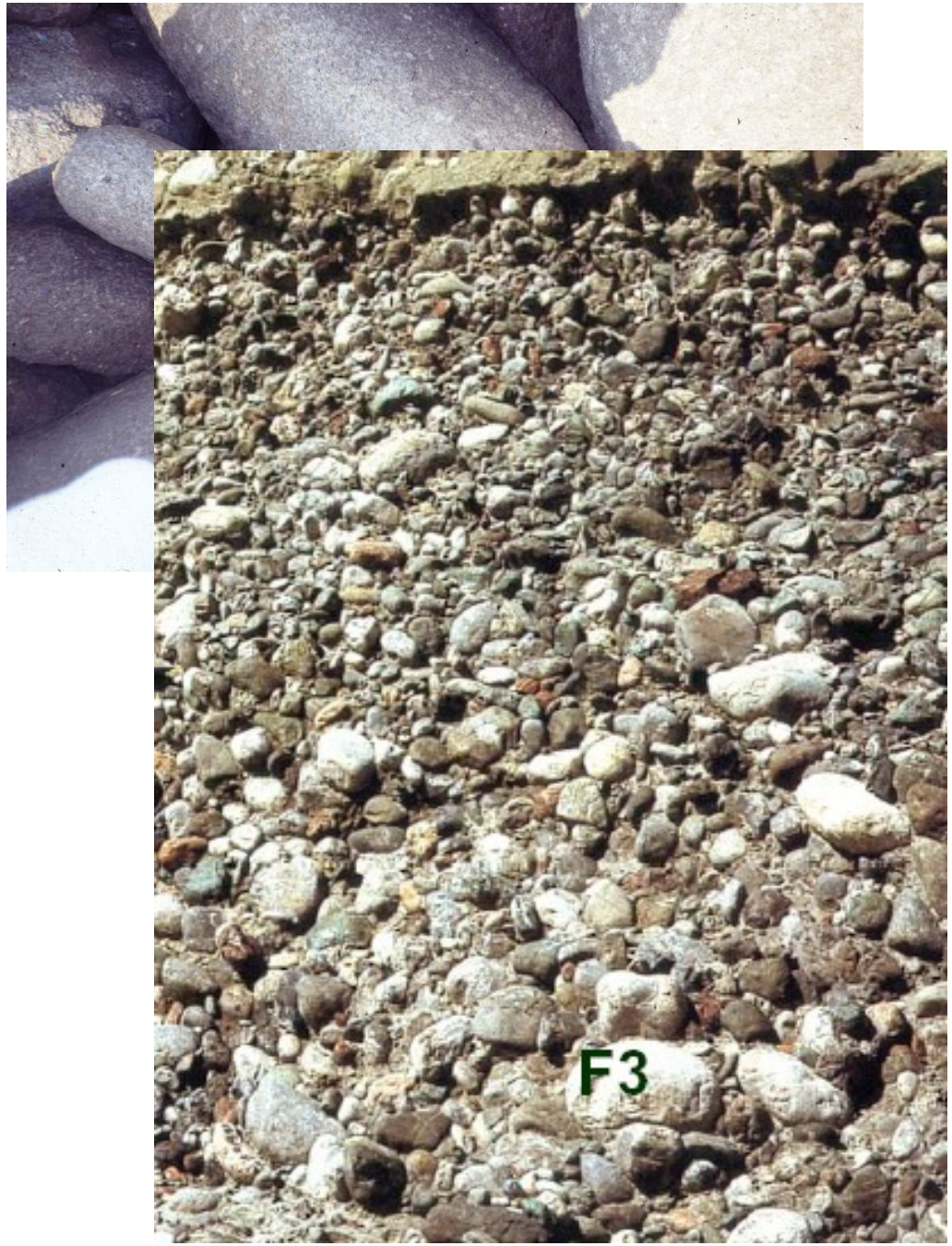
Permeabilidade e porosidade
Areias e arenitos



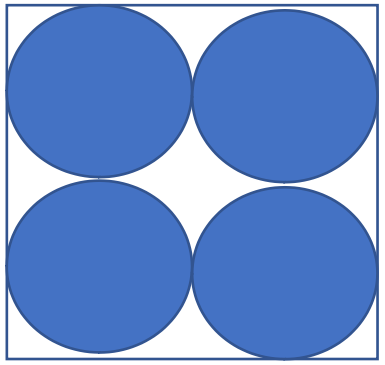
www.petrowiki.org

Fatores que controlam ø e K
(escala centimétrica a micrométrica)

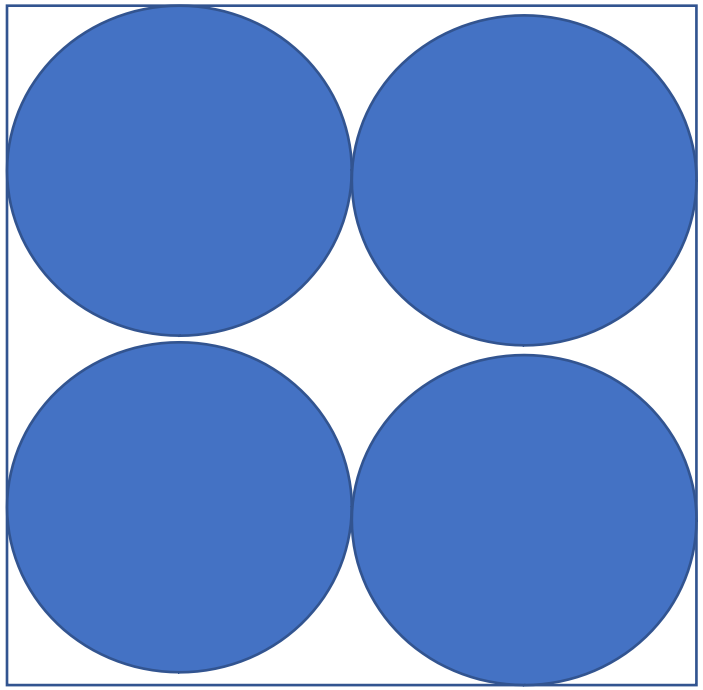
Granulação do arcabouço



ø e K

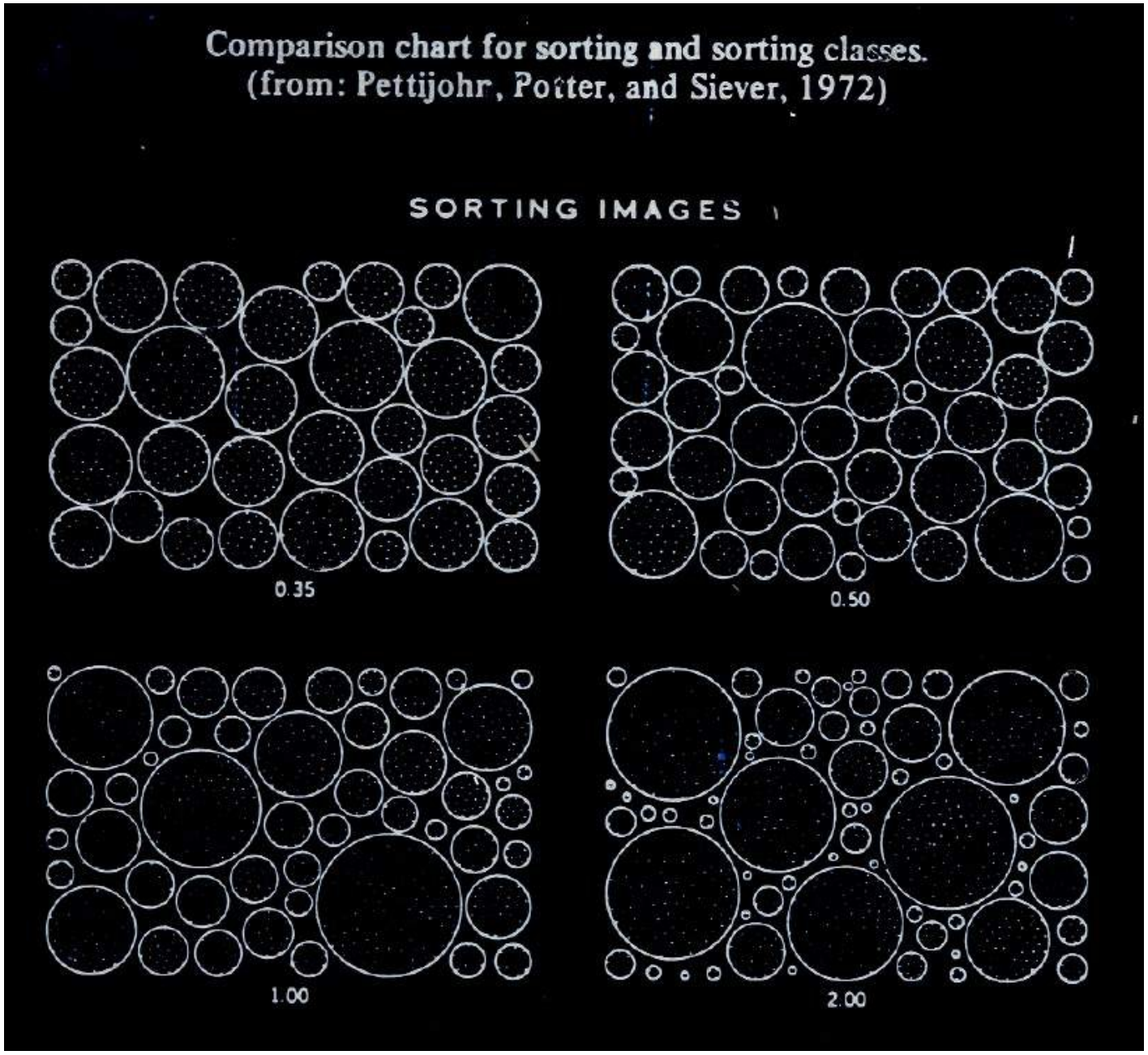


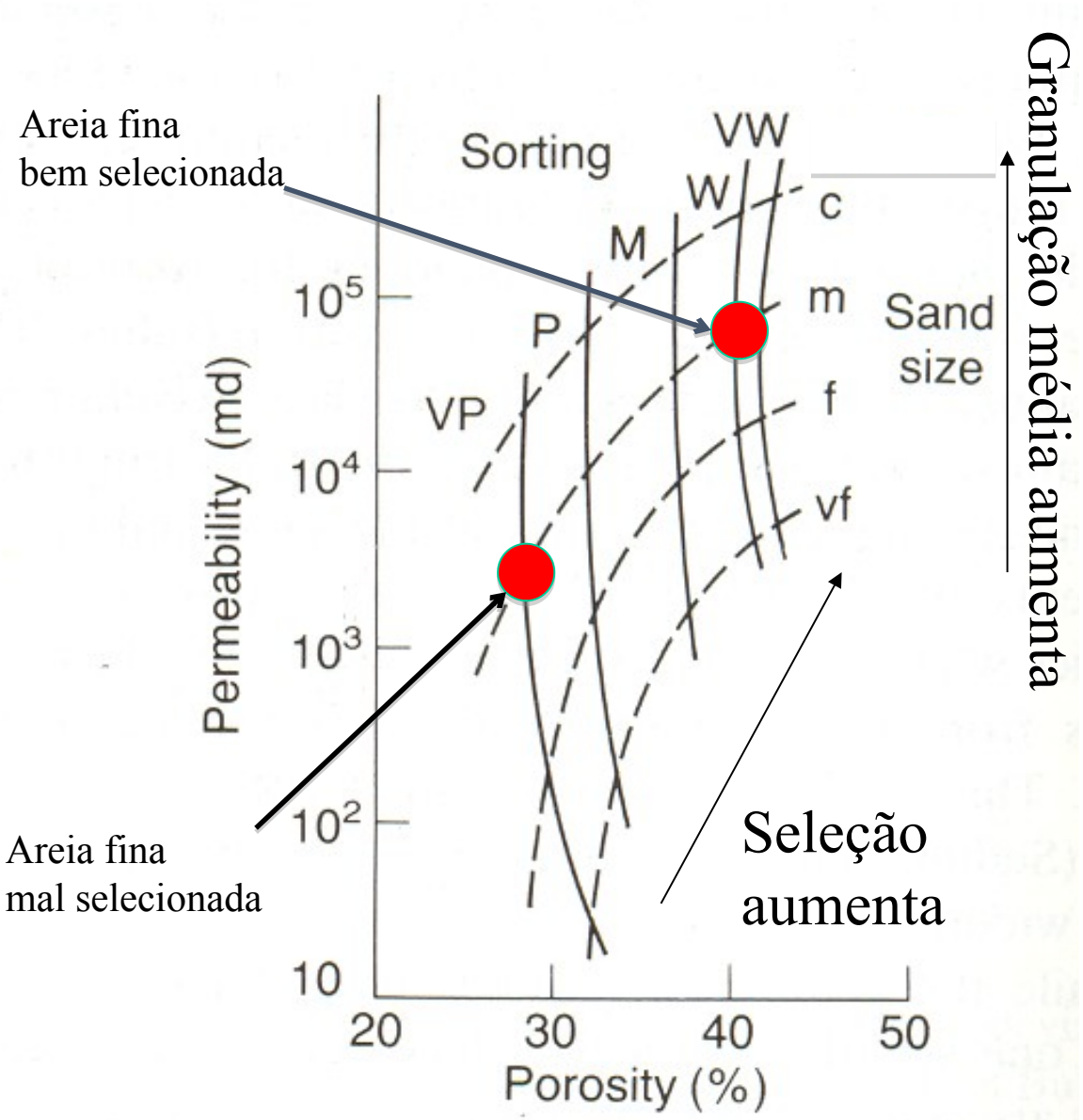
0,1 mm



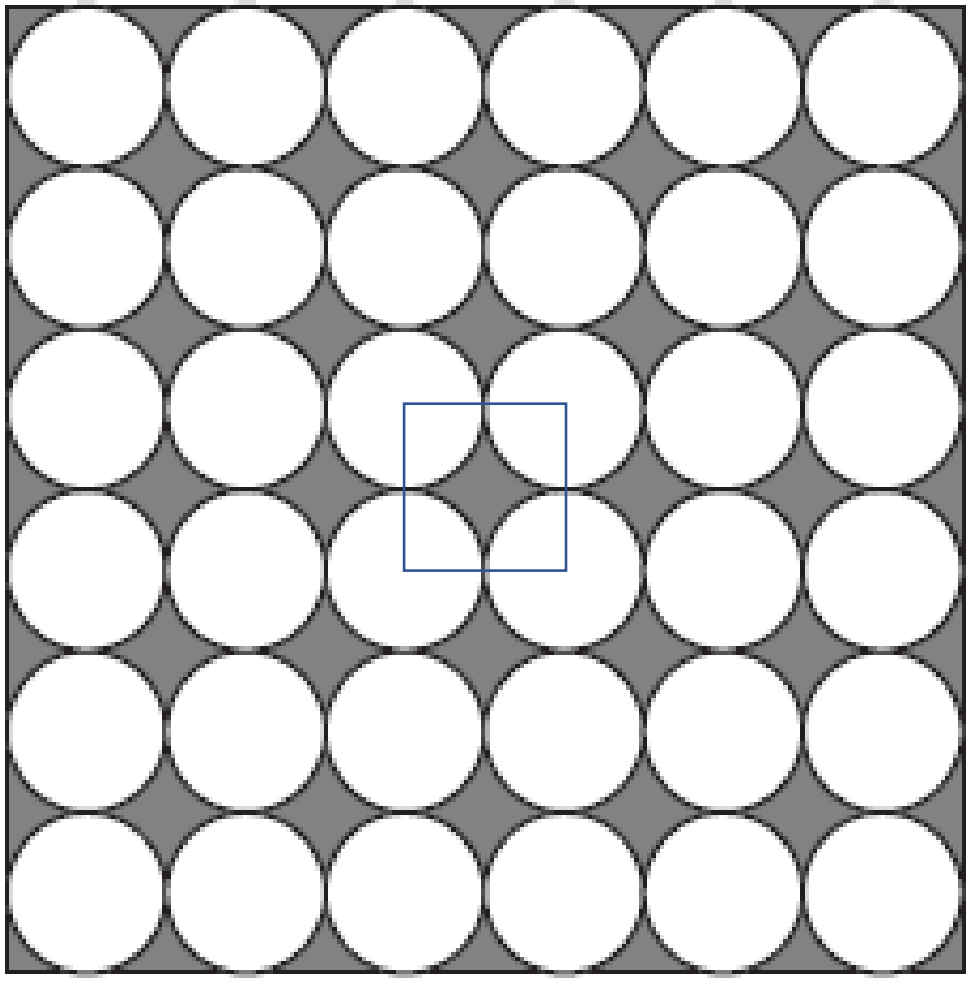
0,1 mm

Seleção granulométrica



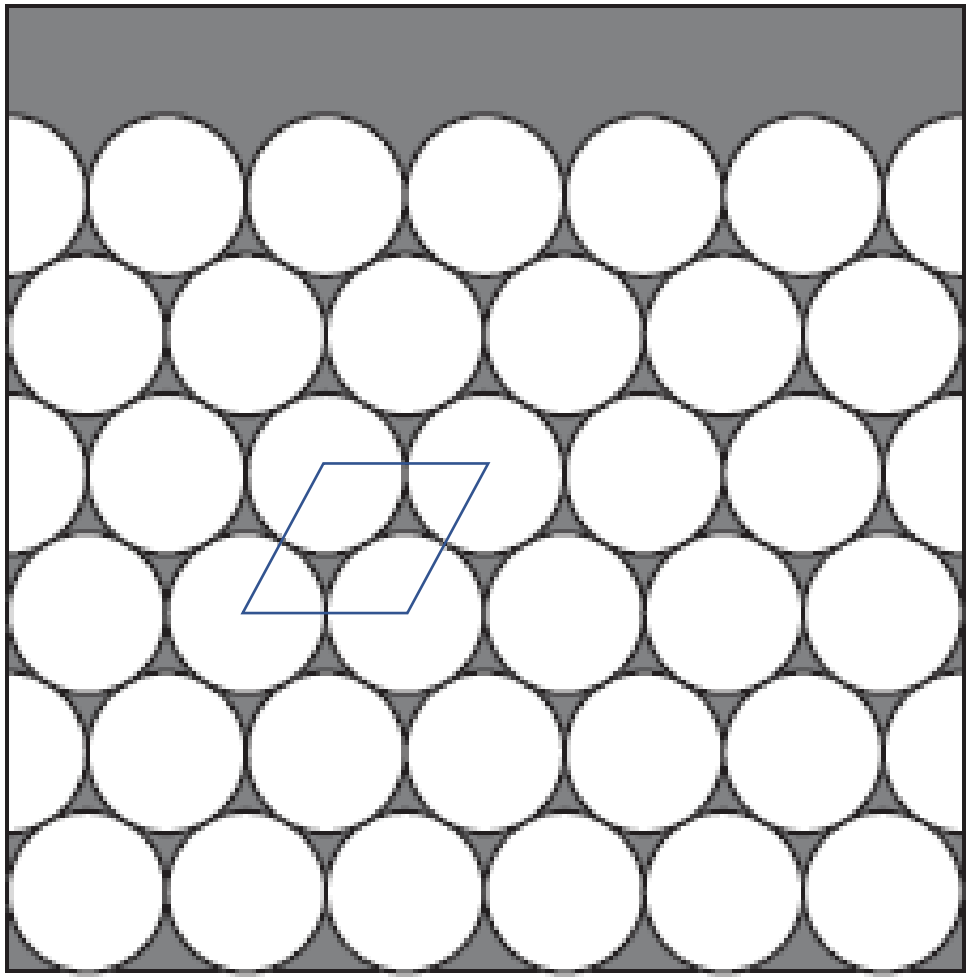

Areia fina
bem selecionada
Areia fina
mal selecionada
Sorting
VW
W
M
P
VP
c
m
f
vf
Sand
size
Granulação média aumenta
Seleção
aumenta
Permeability (md)
10^5
10^4
10^3
10^2
10
20
30
40
50
Porosity (%)

Empacotamento do arcabouço



loose packing - pre-compaction

Empacotamento cúbico (Ø = 48%)

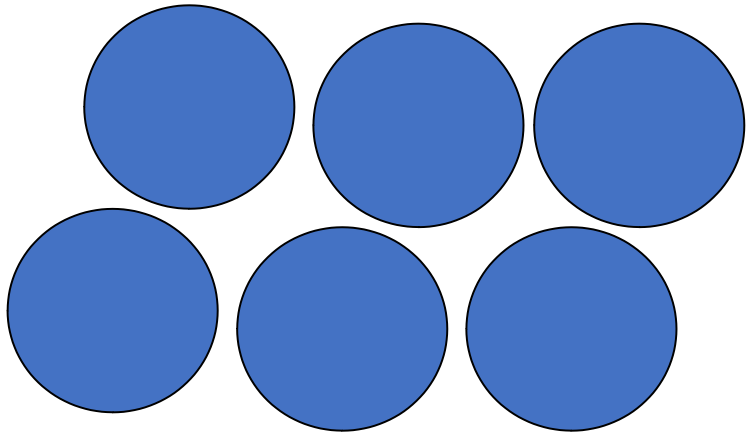


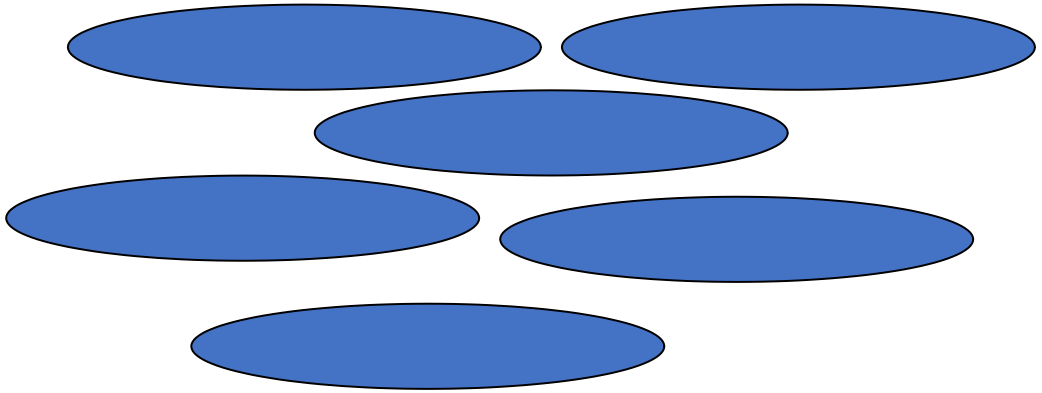
tight packing - post-compaction

Empacotamento romboédrico (Ø = 26%)

Nichols (2009)

Forma dos grãos do arcabouço

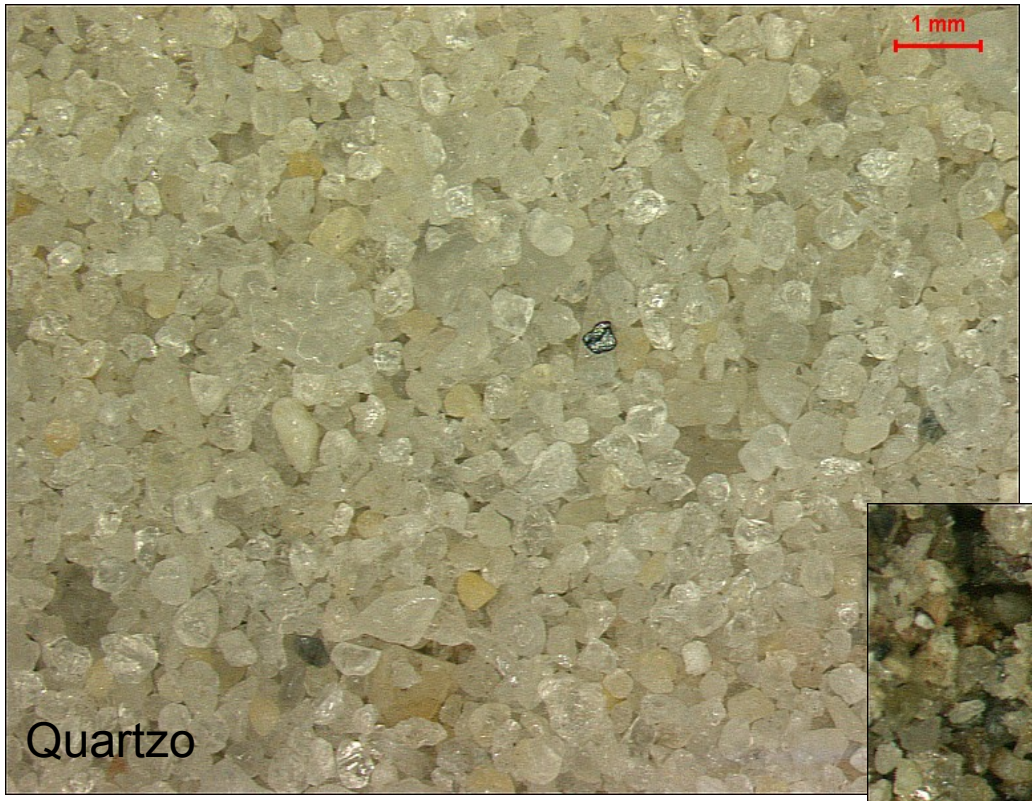


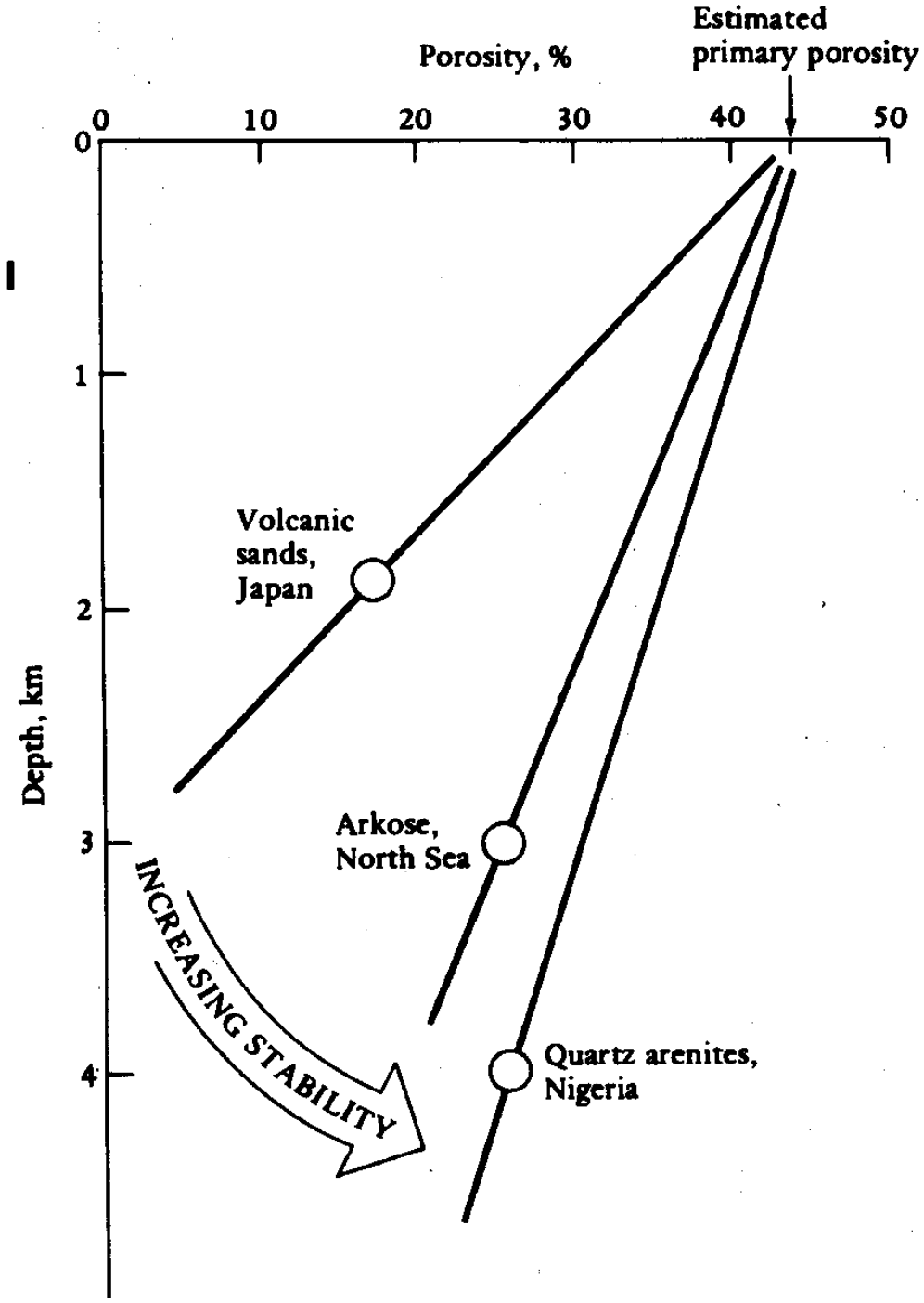


ø e K
vs.
Fácies

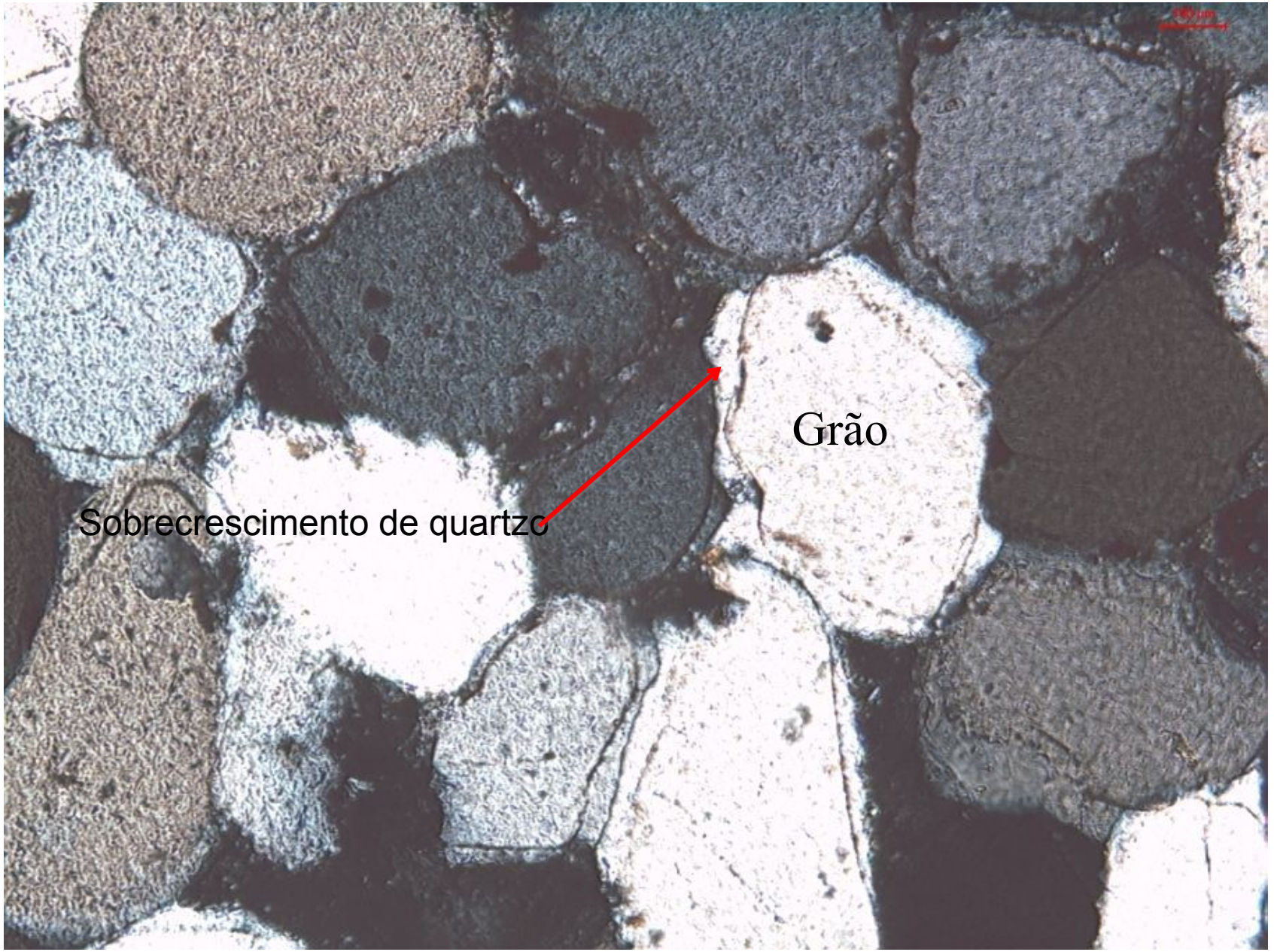
Alteração diagenética da porosidade

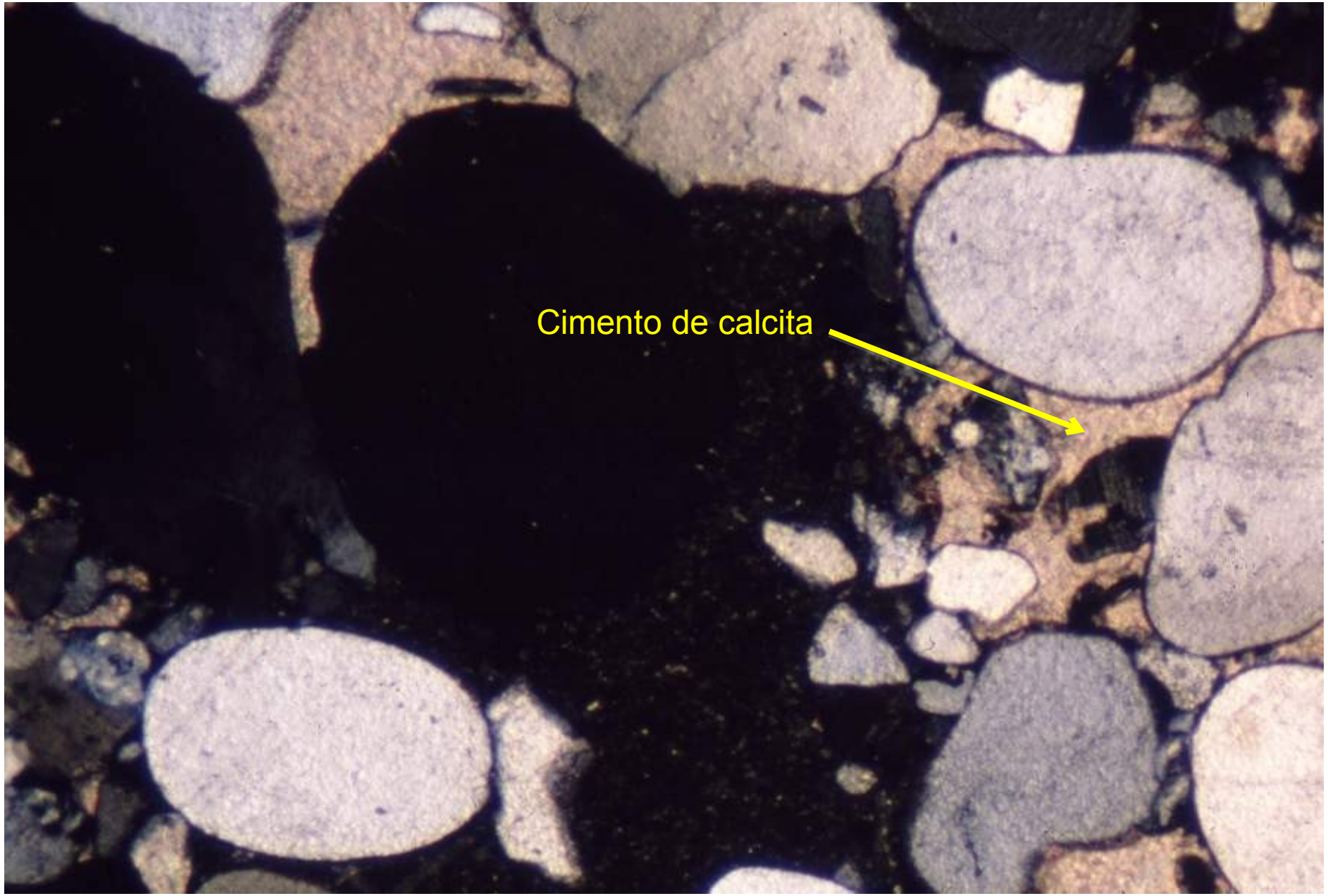
Influência da composição do arcabouço na porosidade primária

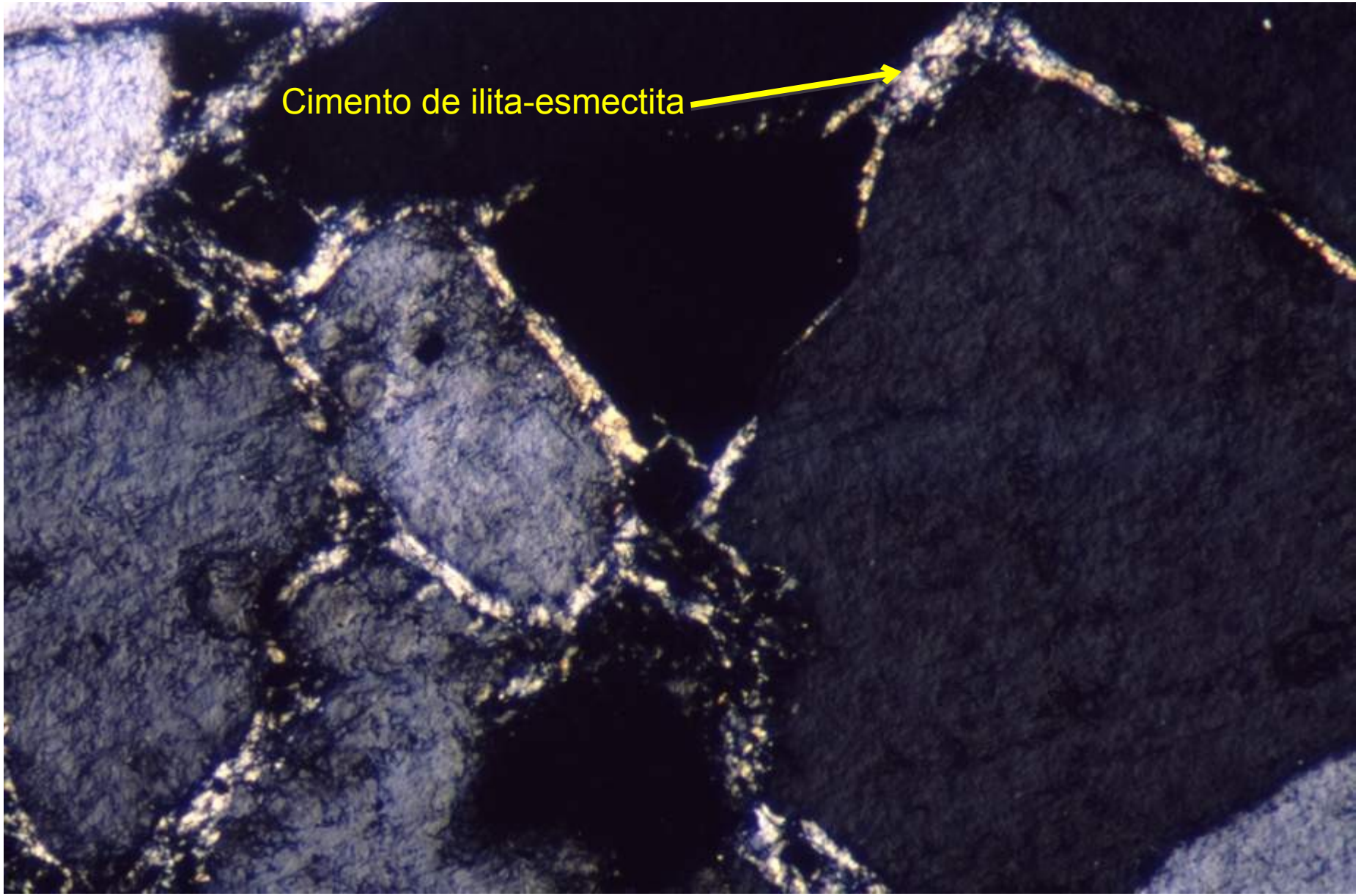



Porosity, %
Estimated primary porosity
0
10
20
30
40
50
Depth, km
1
2
3
4
Volcanic sands, Japan
Arkose, North Sea
Quartz arenites, Nigeria
INCREASING STABILITY

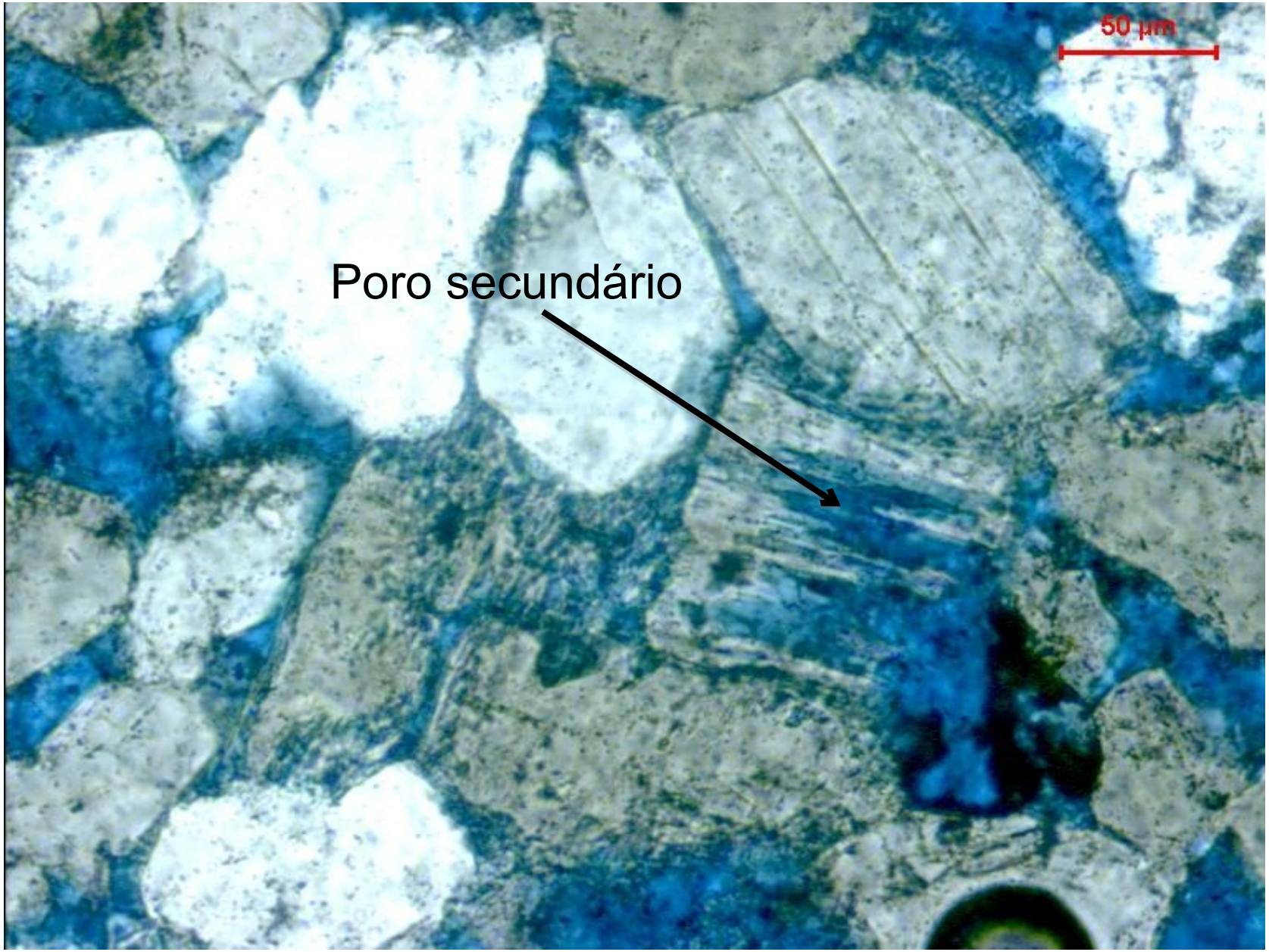
Cimentação

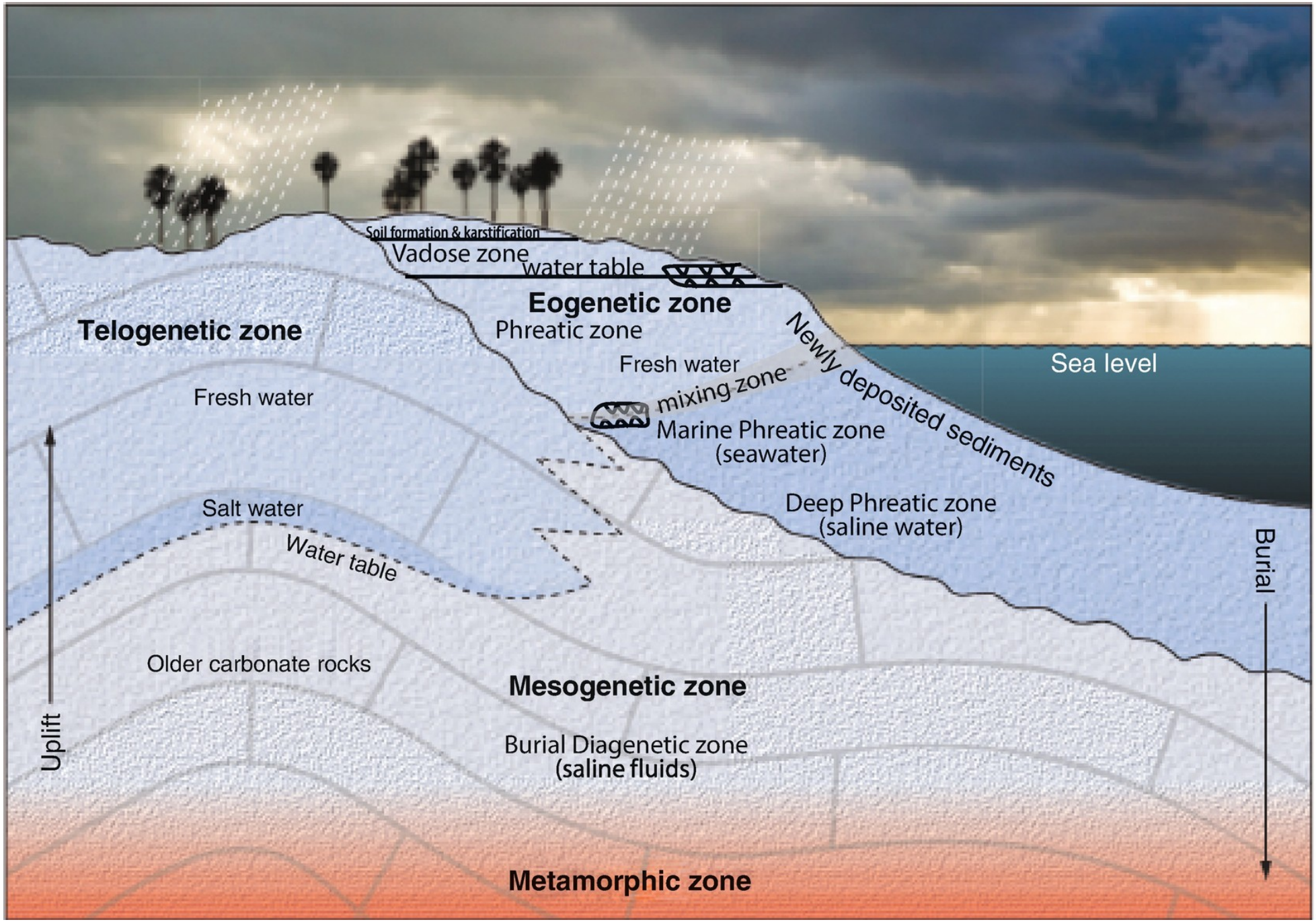



Cimento de calcita


Cimento de ilita-esmectita

Dissolução pós-deposicional





Montañez & Laura J. Crosse (2018)