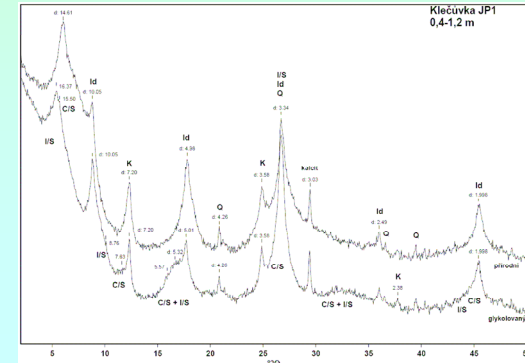
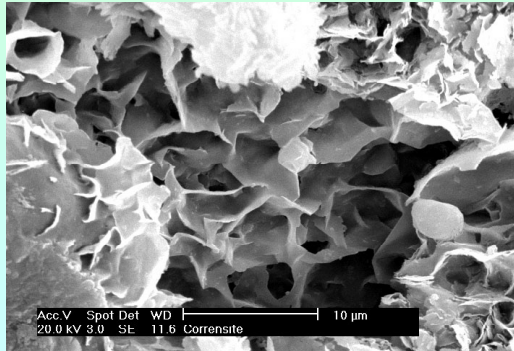


GA931

JÍLOVÉ MINERÁLY



Mineralogie
Geneze
Využití



JS 2013

juraj.francu@geology.cz

Osnova

1. **Úvod - v jakém geol. prostředí najdeme jílové min.**
2. **Metody výzkumu JM**
3. **Struktury a látkové složení JM**
4. **Klasifikace a skupiny JM**
5. **Prostředí a mechanismus vzniku JM**
 - sedimentární pánve
 - postsedimentární přeměny JM po překrytí
 - hydrotermální prostředí
8. **Aplikovaná jílová mineralogie**

Literatura

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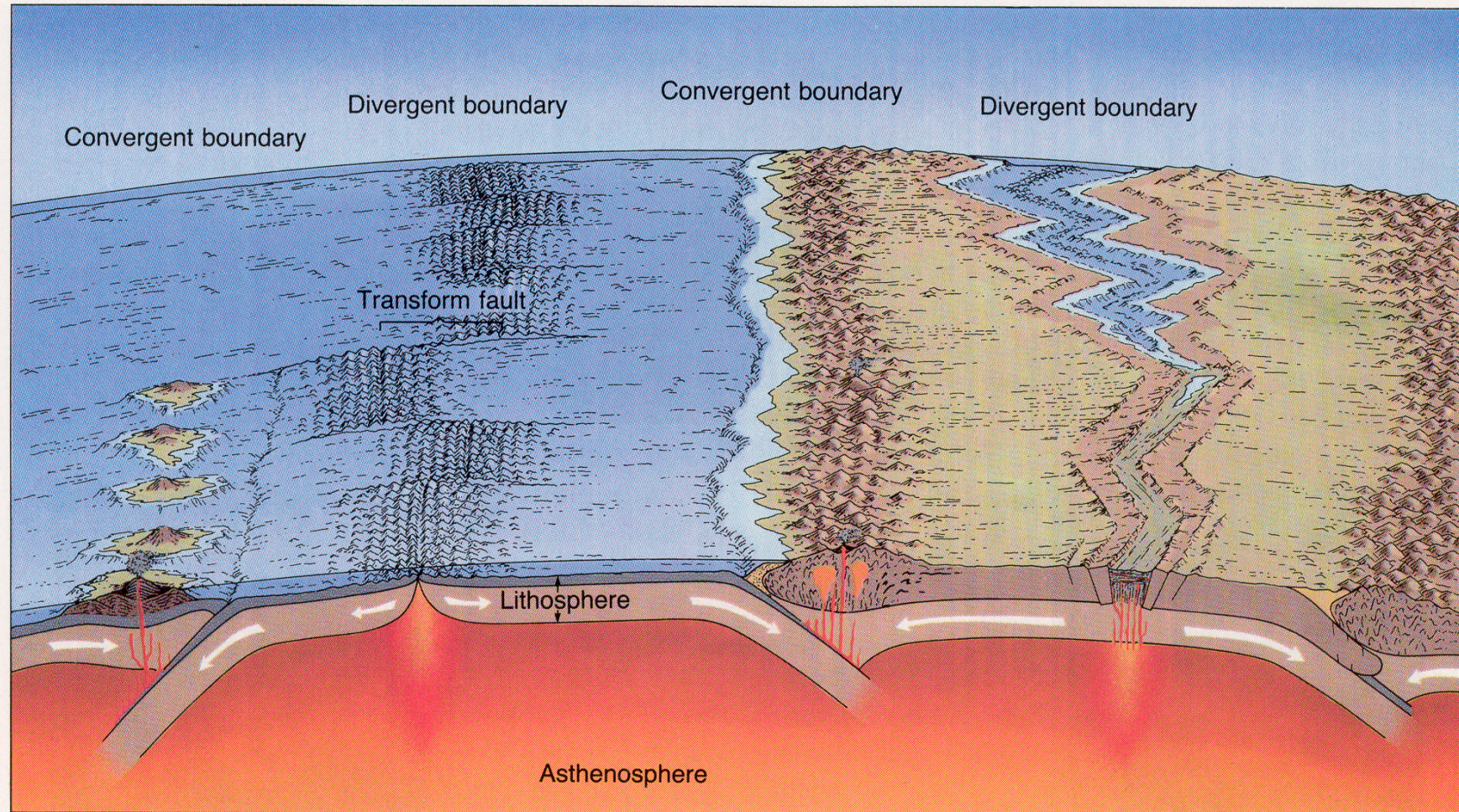
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Weaver C.E. (1989) Clays, Muds, and Shales. Dev. In Sedimentology 44. Elsevier, Amsterdam.

Joann E. Welton (1984) Sem Petrology Atlas. Methods in Exploration Series. AAPG, Tulsa 237 p.

Kužvart M., 1984: Ložiska nerudných surovin. Academie Praha

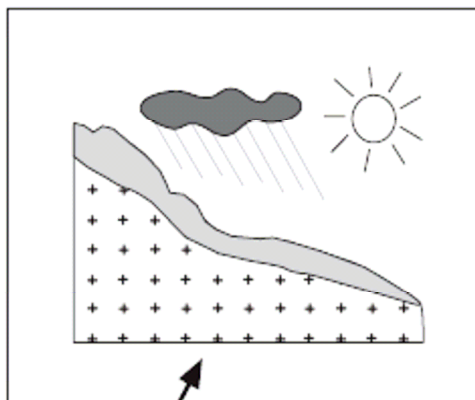
Geneze jílových minerálů v zemské kůře



Prostředí vzniku

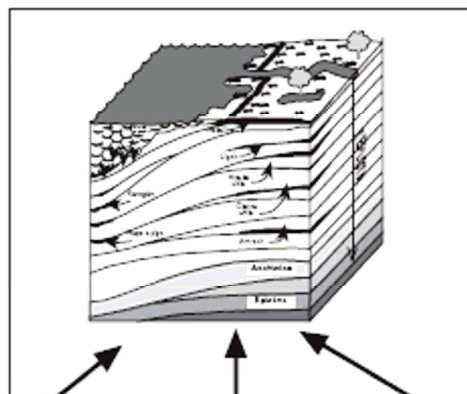
Hypergenní kůry zvětrávání

Al,Fe,Mg-smektit, kaolinit,
kaolinit-smektit, chlorit,
vermikulit, illit



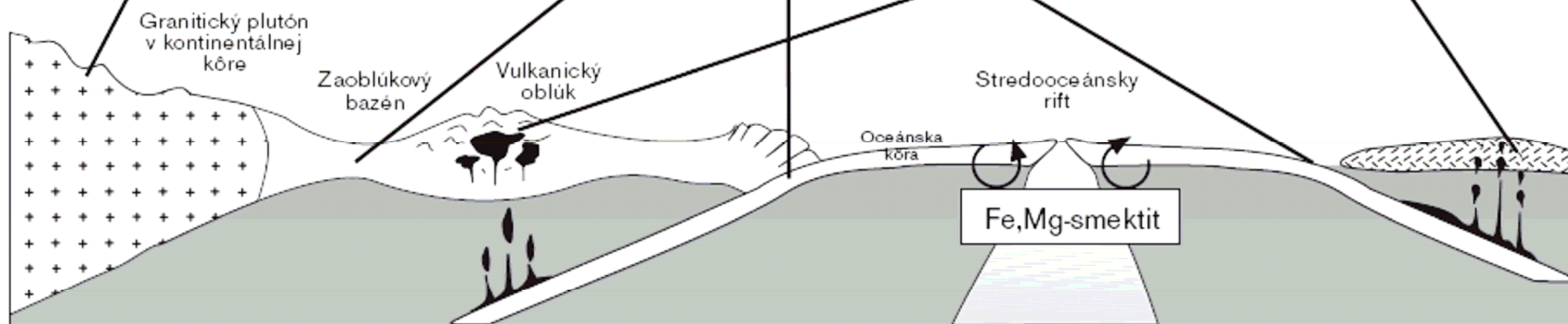
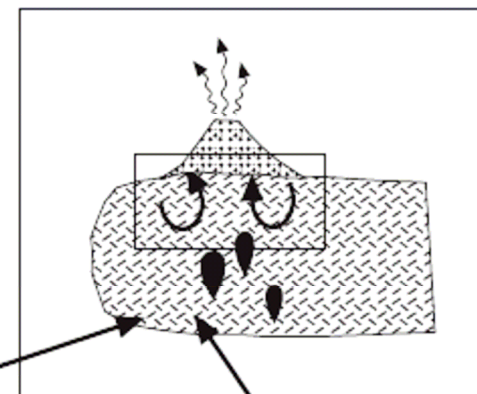
Sedimentární a diagenetické

Illit-smektit, rektorit, illit,
pyrofylit, chlorit-smektit,
paragonit

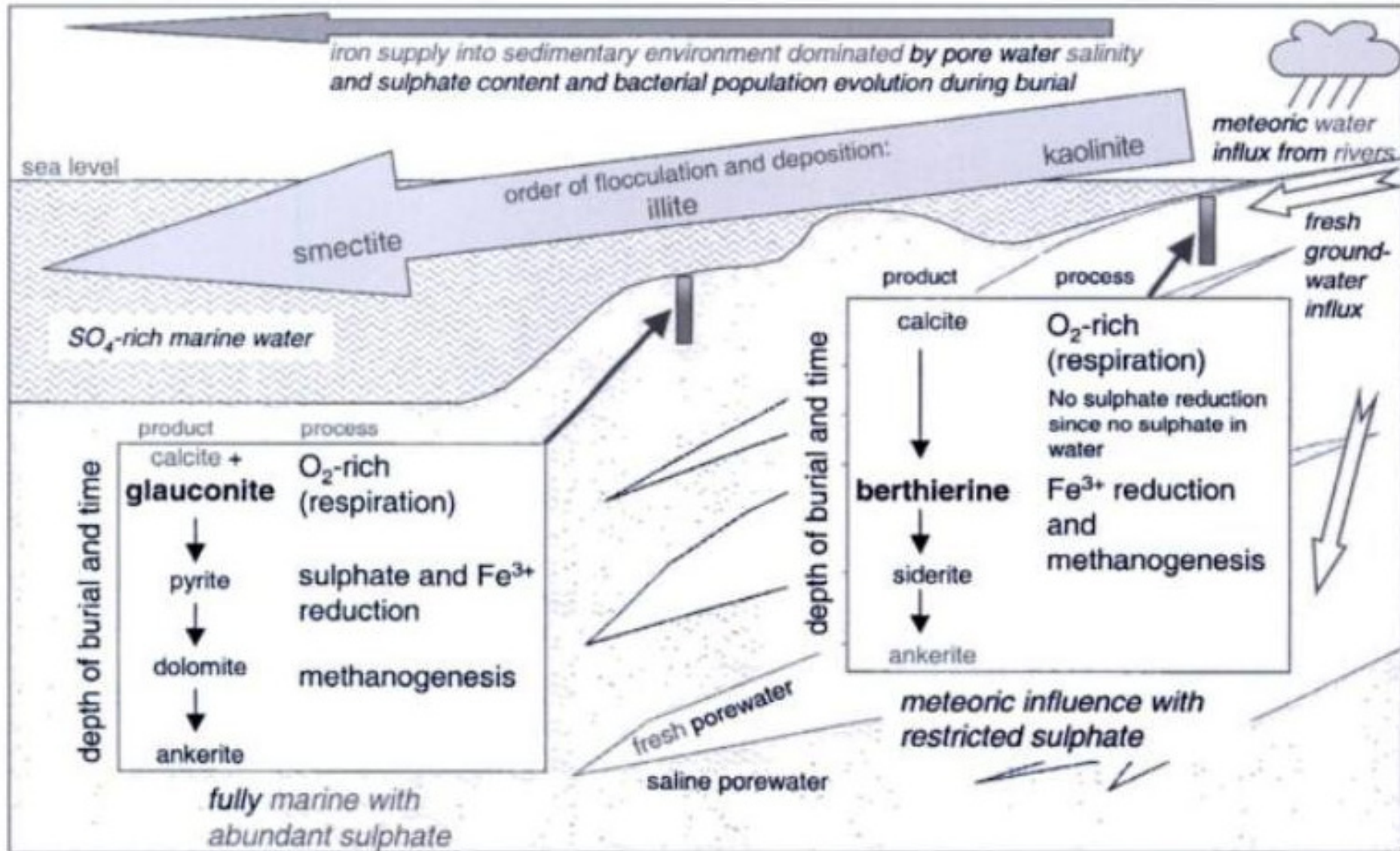


Hydrotermální

Al,Mg-smektit
kaolinit, dickit, nacrit
pyrofylit, illit, illit-smektit



Jílové minerály - mořské prostředí



Jílové minerály - mořské prostředí

Fig. 9 Clay eodiagenesis in marine eogenetic environments. Marine sediments with a significant freshwater influx will have limited sulphate, and thus sulphide, and limited growth of pyrite. Berthierine forms close to the sediment surface but requires isolation from oxidized water to prevent re-oxidation (Odin & Matter, 1981). As primary Fe^{3+} is reduced, the subsequent Fe^{2+} is free to form the clay berthierine in the methanogenic zone and then siderite in the deeper decarboxylation zone (Pye *et al.*, 1990). Fully marine sediments have abundant pyrite and thus minimal berthierine in the methanogenic and sulphate reduction zones. Glauconite forms on, or near to, the sediment surface in condensed sequences that have time enough for biological alteration of detrital clay minerals (Pryor, 1975). In the deeper decarboxylation zone Fe-rich carbonates can form, as in the case of brackish pore waters. Flocculation leads to distinct zonation of geochemically aggregated clay minerals, with kaolinite floccules forming closest to shore, smectite floccules in the ocean basin and with illite intermediate (Edzwald *et al.*, 1974).

Jílové minerály v aridních oblastech

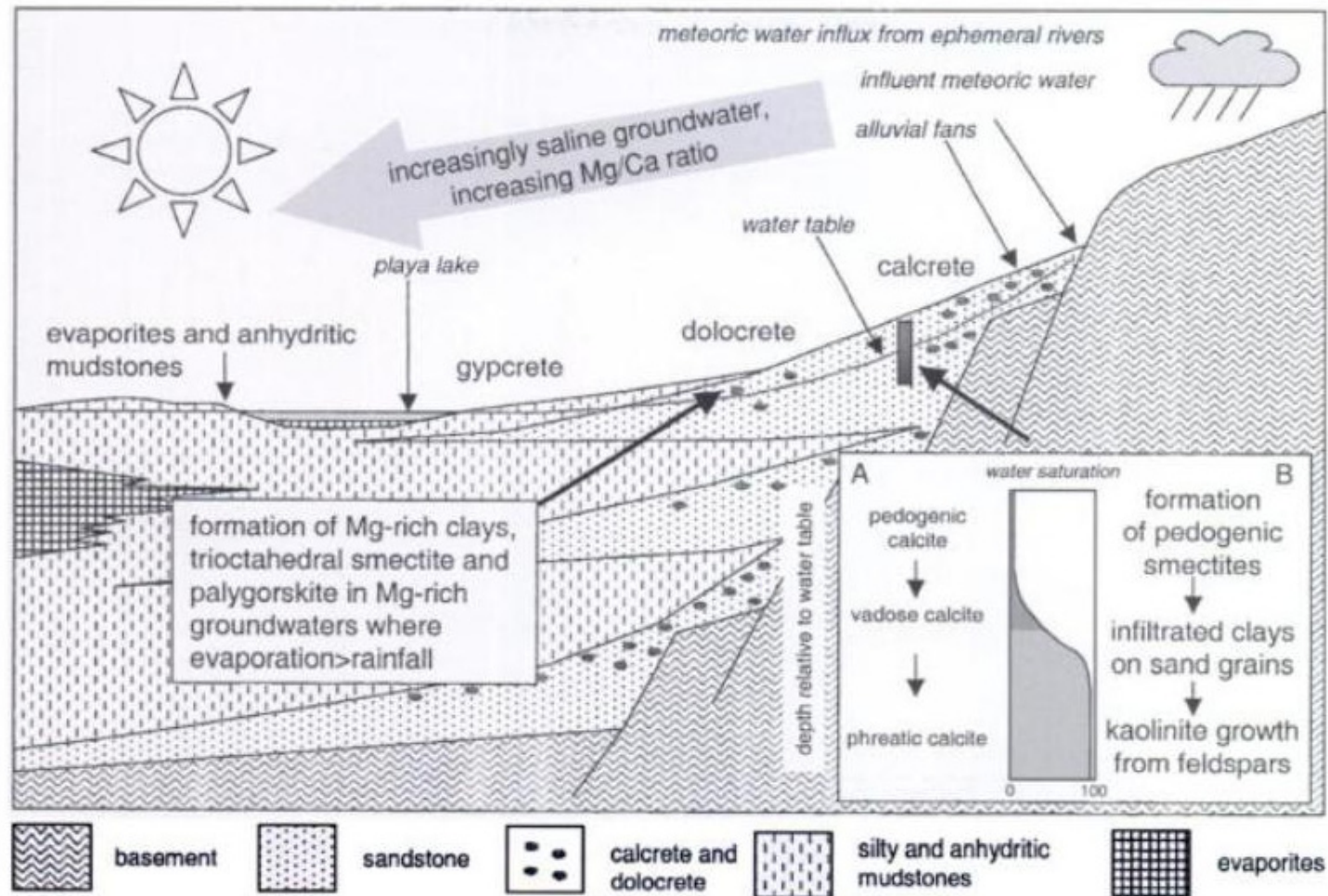
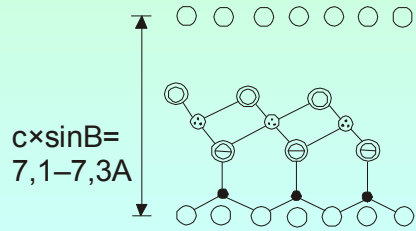
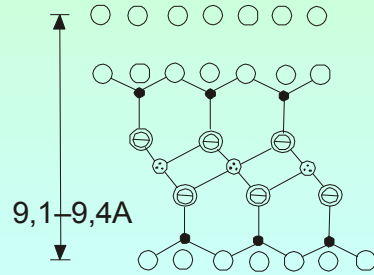


Fig. 8 Clay eodiagenesis in arid eogenetic environments. Pedogenesis will lead to smectite growth in soils on sands in the upper and middle reaches of hydrological basins. In the unsaturated zone of aquifers, clay infiltration will occur if percolating waters contain suspended clay minerals (Morales & de Ros, 1990). Clay infiltration will occur when groundwater evaporation exceeds the rate of percolation, leaving the suspended clay minerals coated on sand grains. Kaolinite may form from detrital feldspars in the aquifer if the groundwater is flowing and being recharged. In the lower reaches of the hydrological basin, where the Mg/Ca ratio has increased following calcrete formation, Mg-rich clay minerals, as well as dolocrete, may form in the sediment.

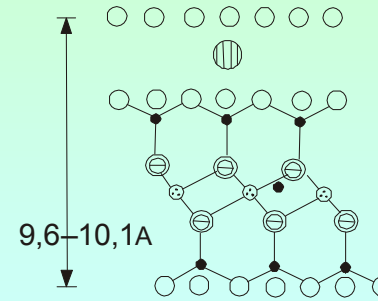
Struktury JM



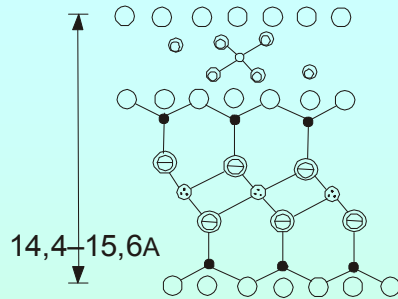
serpentin-kaolinit
($x \sim 0$)



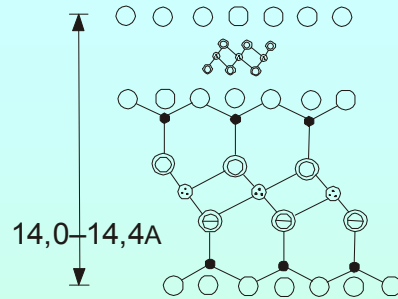
mastek-pyrofyllit
($x \sim 0$)



slídy (illit) ($x \sim 1,0$) a
křehké slídy ($x \sim 2,0$)



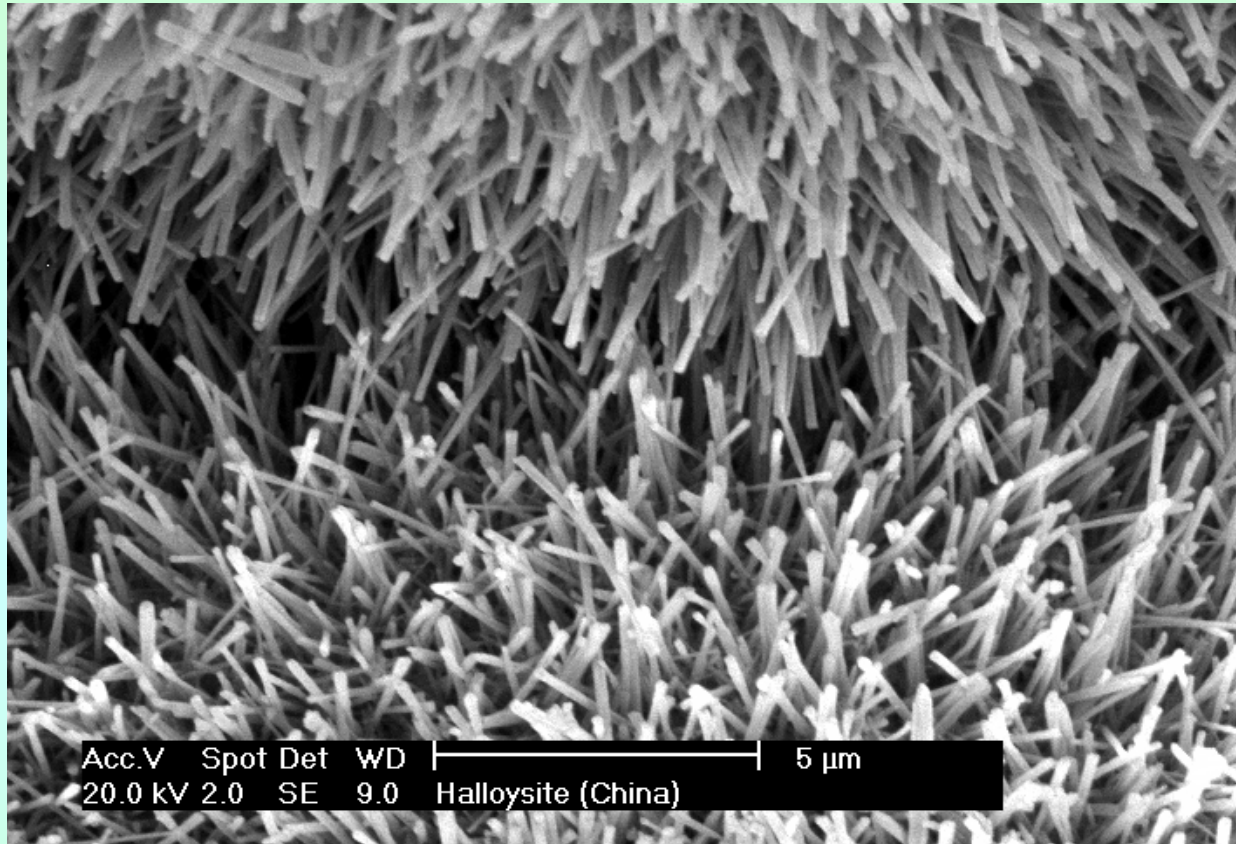
smektity ($x \sim 0,25-0,6$)
a vermikulit
($x \sim 0,6-0,9$)



chlorit (x je variabilní)

- = kationt v tetraedrech
- ⊕ = kationt v oktaedrech
- ⊖ = mezivrstevní kationt
- = vyměnitelný kationt
- = kyslík
- ⊙ = hydroxidová skupina
- ⊗ = molekuly vody
- ⊕ = kyslík + hydroxidová skupina (v projekci)

Morfologie jílových minerálů - trubice

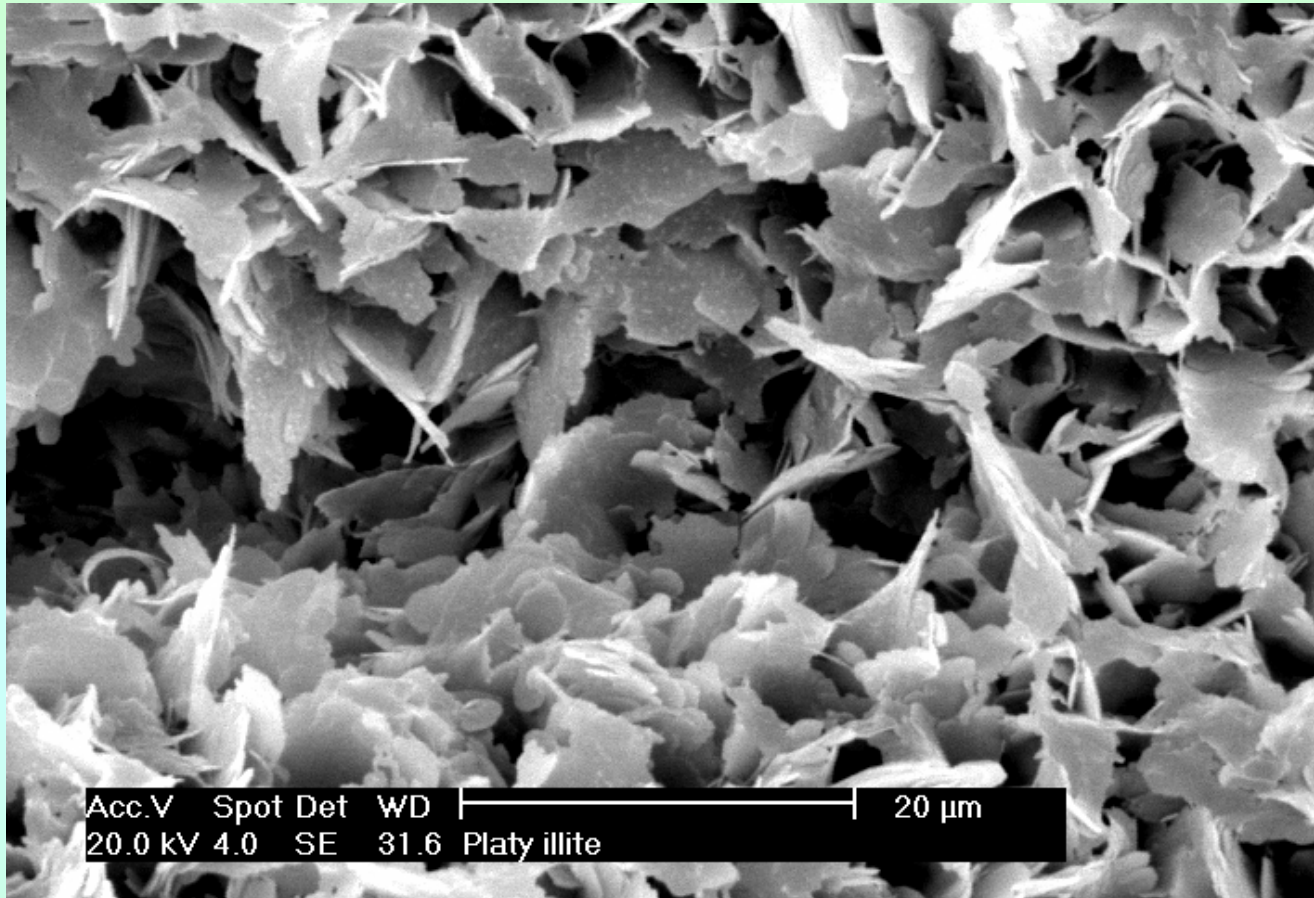


Tubular Halloysite from Yunnan, China

Photo courtesy of M. Roe, Macaulay Institute, of a sample from Ye Ying, Zhejiang University, China

<http://www.minersoc.org/pages/gallery/claypix/>

Lupínkovité tvary (illit)

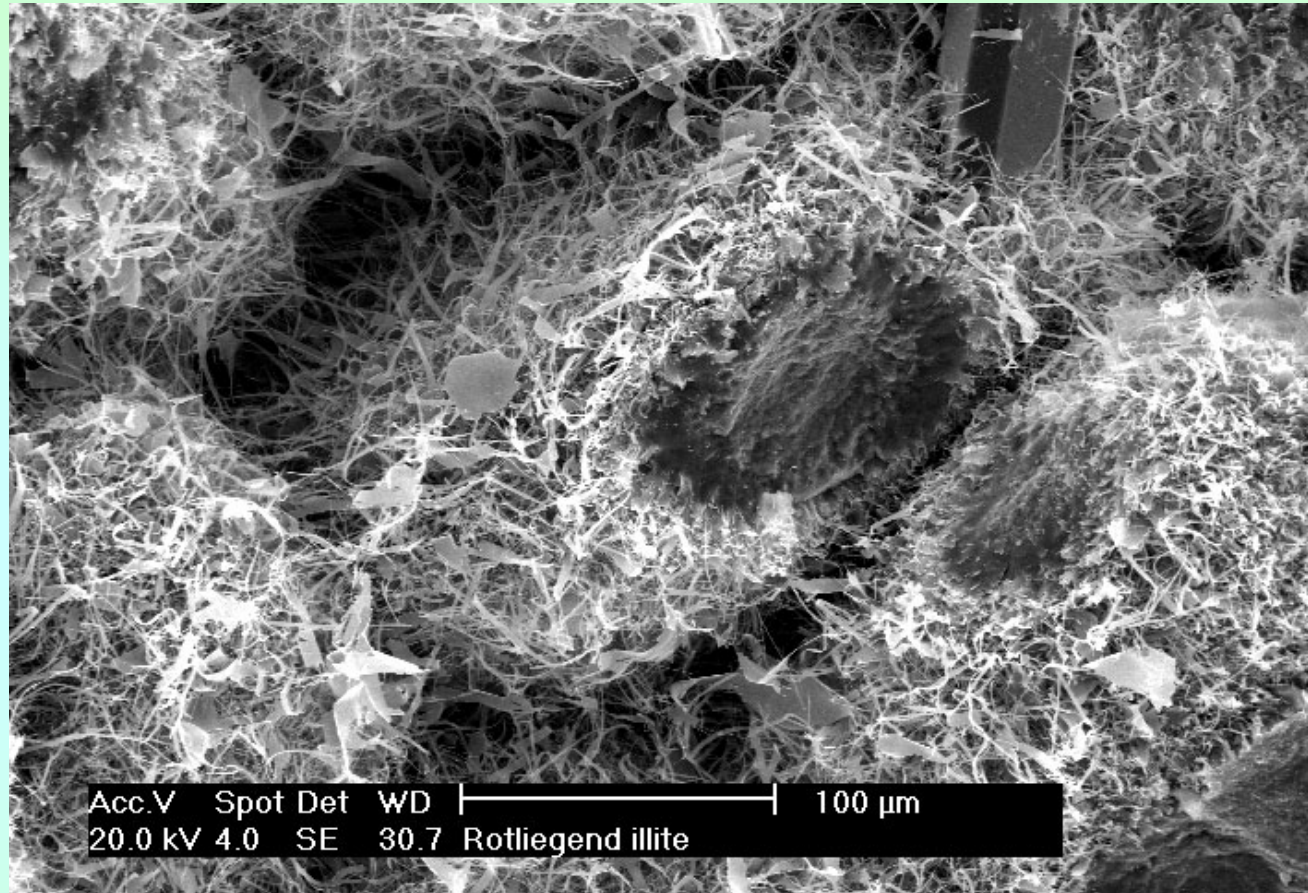


Platy Illite from the Rotliegend of Northern Germany

Photo courtesy of M. Roe, from a sample in the Macaulay Institute Collection)

<http://www.minersoc.org/pages/gallery/claypix/>

Vláknité tvary jílových minerálů

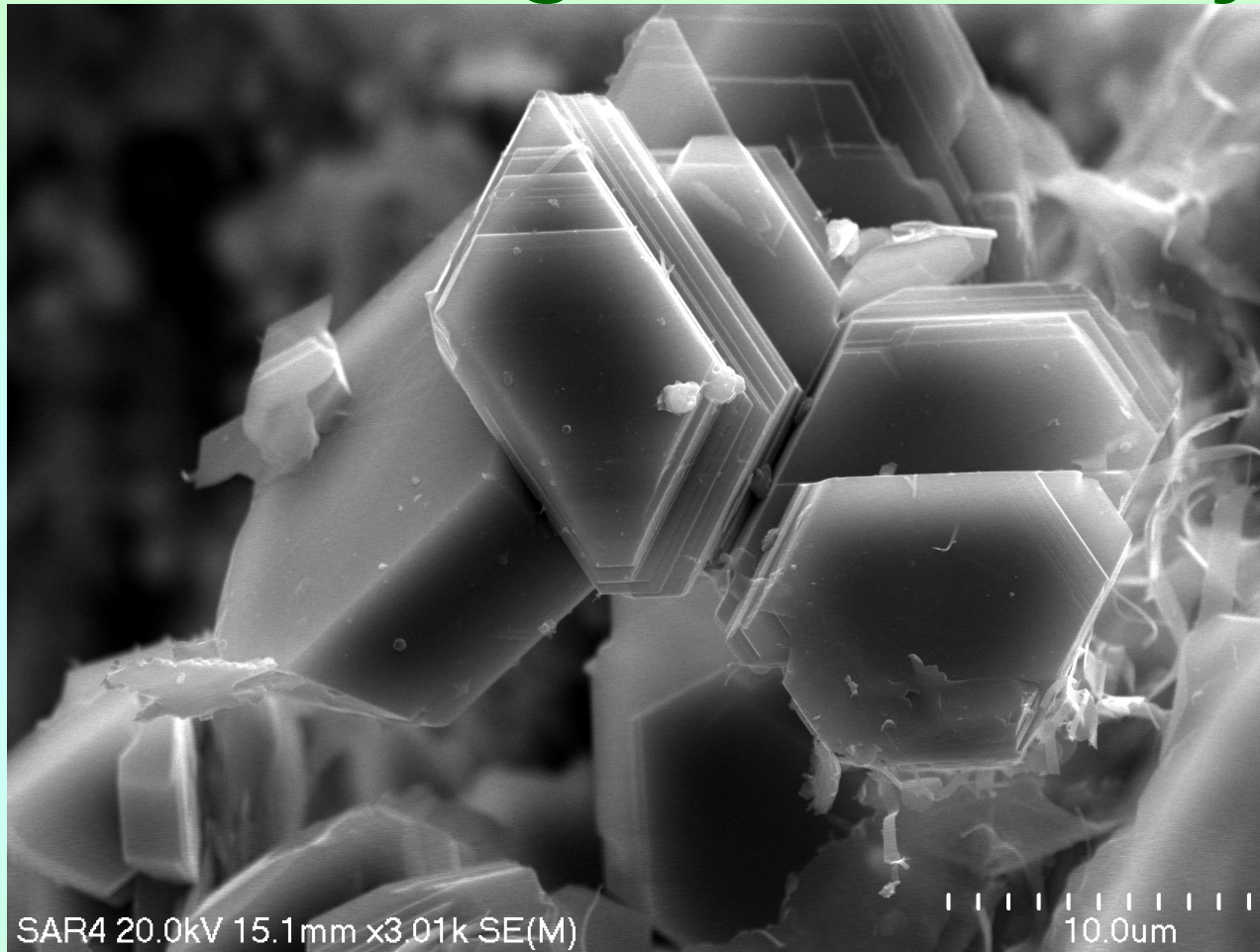


Fibrous illite, critical point-dried from methanol, Rotliegend Sandstone, North Sea

Photo courtesy of M. Roe, Macaulay Inst. Sample 'Ill-34': Macaulay Collection)

<http://www.minersoc.org/pages/gallery/claypix/>

Pseudohexagonální destičky

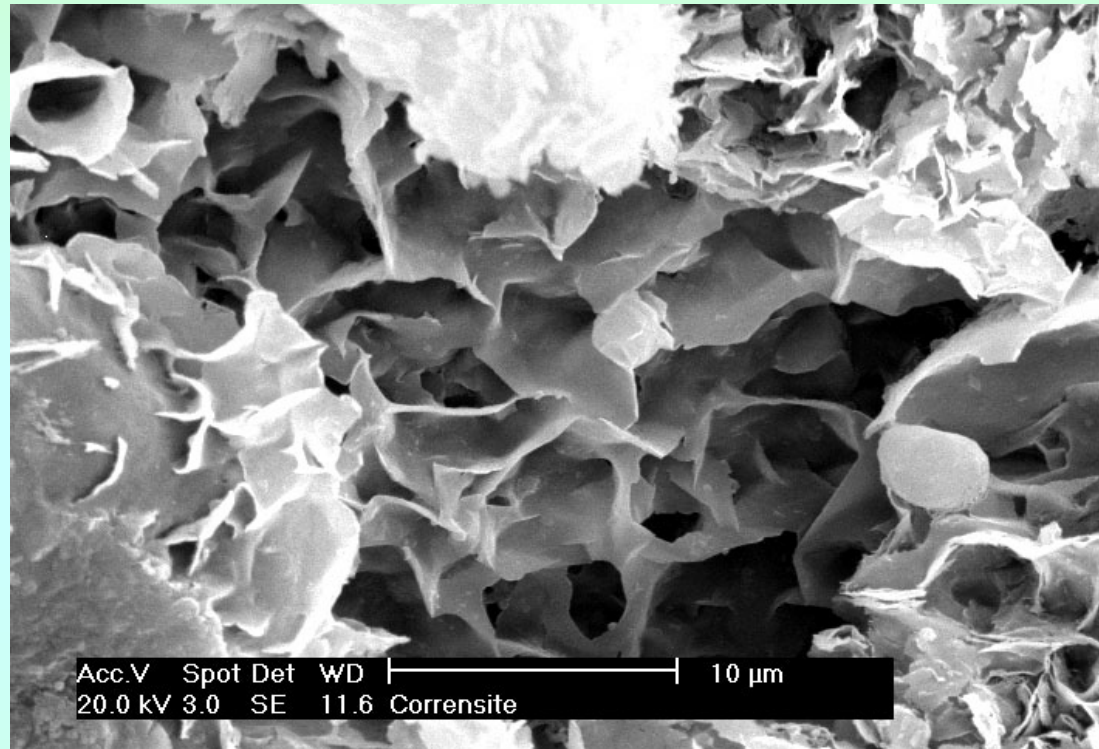


Kaolinite Weisslied sandstone from Fore Sudetic Monocline

Photo courtesy of Michal Skiba, Institute of Geological Sciences, Jagiellonian University, Kraków

<http://www.minersoc.org/pages/gallery/claypix/>

Morfologie "včelí plástvy"



**Korensit (smíšeně vrstevný chlorit-smektit)
Perm, Yates Formation, Texas**

Photo courtesy of M. Roe, Macaulay Institute. Sample 'Y2', Macaulay Colln.

<http://www.minersoc.org/pages/gallery/claypix/>

Aplikace jílové mineralogie

1. Stavebnictví - zakládání staveb (stlačitelnost)
2. Silniční stavitelství (zvlnění dálnic)
3. Ekologie _ sorbenty, čističky, likvidace škodlivých látek
4. Ekologie - skládky, izolace podloží a nadloží proti úniku škodlivin
5. Nafta a plyn - kolmatace ložiskových horizontů
6. Suroviny - těžba jílu pro keramický průmysl a rekultivace

