Introduction: Analog studies play an important role in space materials education. Various aspects of analogies are used in our courses. In this year two main rock types of NASA Lunar Set were used in analog studies in respect of processes and textures with selected industrial material samples. For breccias and basalts on the lunar side, ceramics and steels were found as analogs on the industrial side. Their processing steps were identified on the basis of their textures both in lunar and in industrial groups of materials.

Samples: In our studies we used the following samples:

**A) Breccias:**
- 14305 - breccia-in-breccia texture
- 15299 - regolith (para)-breccia
- 65015 - impact melt (para)-breccia, poikilitic
- 72275 - para-brecchia, 60025 - mechanical mixing of cumulate anorthosites, ortho-breccia

**B) Basalts:**
- 74220 - fast cooling rate, lava fountain droplet [1]: 68501 – clasts in breccia, variolitic, 72275 - spherulitic-volcanic clast in breccia
- 14305 - intergranular type clasts in breccia: 72275 - subophitic clast in breccia, 12002 - porphyritic sample: 70017 - ophitic sample: 12005 - poikilitic sample (basalts are in cooling rate sequence).

**Ceramics:**
- Bi-cske-sample (pottery)
- Felsővadász-sample (pot.)
- Szécsény-sample (pot.)
- Szarvas-Sample (pot.)

**Steels:**
- perlite-sample
- bainite-sample
- martensite-sample

Ceramics and breccias: For industrial materials the sequence of the main steps of operations were followed in textural formation (breaking, crushing, transporting, mixing, recycling and final welding or heating).

Basalts and steels - cooling rate: Analog study for lunar basalts made it possible to arrange them in cooling rate sequence. However, for industrial materials the hardening in the steel industrial textures form a sequence of the main steps of operations also according to the cooling rate of the heated steel samples. We can follow both the process and the textures formed in the TTT diagrams.
Discussion: Materials from nature and from manufacturing have common and distinct characteristics. One of their main characteristics is their texture and formation process. The relations between formation process and the produced textural variants are better known for industrial materials. But natural processes are also “mapped” and the relation are summarized in “material maps” like TTT, pT, cT and many other diagrams. If students learn planetary and industry materials parallel, then 1) they have exciting insight to far and exotic topics, 2) they get acquainted with planetary processes and manufacturing processes parallel 3) they get acquainted material maps both with microscope studying textures and their forming parameters, 4) functions may be deduced from the relations between textures and manufacturing steps. This way lunar sample analog studies with industrial counterparts suggest recognition of steps in formation of other complex material systems and this will initiate their own experiments and studies on more complex materials, too.

Summary: In our analog studies NASA lunar samples were compared with the petrography-manufacturing technology conclusions on their formation processes and textures. This work focuses a valuable type of use of the NASA Lunar Set in planetary materials education.

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References: