

From Thessalonike to Selânik: the long continuity of urban ceramic production in the Balkans and the Eastern Mediterranean

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Online Resource 1: the petrographic description of fabrics

Fabric 1: Fine with schist

Samples: THB 01, 02, 05, 06, 08, 21, 22, 24, 25, 26, 27, 29, 30, 31, 33, 35, 36, 45, 47, 49, 50, 51, 55, 60, 61, 62, 65, 66, 67, 68, 70, 71, 72, 73, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 88, 89, 90, 91, 98, 99, 100, 111, 115, 116, 117, 119, 122, 123, 124 (n = 60).

Inclusions

10-20 %. el & eq. sa-sr. Single to open spaced. Weak to strong alignment to margins of samples. Unimodal grain size distribution.

Dominant:

Monocrystalline quartz; eq & el. sa-sr. < 2 mm, mode = 0.2 mm.

Frequent to Few:

Quartzite/Schist; el & eq. sa-sr. < 4 mm, mode = 0.8 mm. This rock consists of quartz crystals that elongated axes tend to follow the same direction. Boundaries are sutured to straight. It can contain muscovite mica (THB 25, 26, 45), a fine-grained brown inclusion (THB 02, 25, 26, 45, 47, 68, 72, 75, 78, 80, 85, 88, 111, 116), green (in PPL and XP) inclusion (THB 62, 70), and opaques (THB 47).

Frequent to Absent:

Limestone; el & eq. sr-r. < 4.2 mm, mode = 0.6 mm. Limestone is micritic with occasional inclusions of fine-grained quartz (THB 100 and 117) or feldspar (THB67). In some samples (THB 71, 91, 115), limestone consists of micritic crystals, fine quartz and brown particles that probably presents an altered mica. In samples THB 26, 29, 36, 49, 51, 61, 71, 72, 77, 79, 90, 116 117, 123, limestone includes voids. Sample THB80 contains limestone with chlorite. Samples THB 33, 77, 78, 83, 123 contain limestone

with relic fossiliferous structure, present in the shape of crescent. Limestone is present in samples THB 01, 05, 06, 08, 21, 22, 25, 29, 26, 27, 30, 31, 33, 36, 45, 47, 49, 50, 51, 55, 60, 61, 62, 65, 66, 67, 70, 71, 72, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 88, 89, 90, 91, 100, 111, 115, 116, 117, 119, 123, 124.

Common:

Polycrystalline quartz; el & eq. sa-sr. < 2.2 mm, mode = 0.6 mm. It consists of coarse quartz with straight boundaries. It can contain a fine-grained brown inclusion (THB 29, 49, 73, 90), fine-grained green inclusion (THB 05, 62, 70, 72) and opaques (THB01).

Common to Very Rare:

Muscovite mica; el & eq. sa-sr. < 1 mm, mode = 0.4 mm. In the majority of samples, muscovite mica can be classified as Rare - Very Rare (THB 01, 02, 21, 22, 25, 27, 30, 31, 33, 36, 45, 47, 49, 50, 51, 60, 61, 62, 65, 66, 67, 68, 72, 75, 76, 77, 79, 80, 81, 82, 84, 85, 88, 90, 98, 100, 111, 115, 116, 117, 119, 122, 124) while Common distribution is present in several samples (35, 73, 91, 123, 05, 06, 55, 70, 71).

Common to Absent:

TFs; eq & al. sr-r. < 3.4, mode = 0.5 mm. TFs are inclusions of yellow, dark red to brown colour (in PPL and XP), sharp to merging borders, high to neutral optical density relative to the surrounding matrix. They can contain quartz (THB 25, 26, 27, 29, 49, 70, 75, 82, 83, 90, 111, 123, 124), muscovite mica (THB 26, 70, 73, 83, 111), fossiliferous limestone (THB 78) and be surrounded by voids (THB 29, 83, 124). They are present in samples THB 01, 02, 05, 06, 08, 21, 22, 24, 25, 26, 27, 29, 30, 31, 35, 36, 45, 47, 49, 50, 55, 60, 61, 62, 65, 66, 68, 70, 71, 72, 73, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 88, 89, 90, 98, 100, 111, 115, 116, 117, 119, 122, 123, 124.

Few to Absent:

Mica schist; el & eq. sa-sr. < 3.4 mm, mode = 0.7 mm. In THB 22, 25, 30, 49, 71 and 72 mica schist is altered and has brown colour in PPL and XP. In THB 61 and 83 mica schist contains opaques. It is present in samples THB 01, 02, 05, 22, 25, 26, 27, 30, 31, 35, 36, 45, 47, 49, 51, 61, 68, 70, 71, 72, 77, 78, 83, 85, 88, 90, 100, 111, 117.

Plagioclase feldspar; eq & el. sa-sr. < 1 mm, mode = 0.3 mm. It is present in samples THB 02, 05, 06, 08, 21, 22, 24, 26, 27, 33, 35, 36, 47, 51, 55, 65, 67, 68, 70, 71, 72, 75, 78, 81, 83, 85, 90, 100, 115, 116, 119, 122, 123, 124.

Biotite mica; el & eq. sr-sa. < 0.6 mm, mode = 0.2 mm. It is present in samples THB 02, 06, 08, 21, 24, 35, 45, 55, 68, 70, 72, 73, 76, 78, 80, 83, 89, 91, 122.

Serpentine; el & eq. sr-r. < 2.2 mm, mode = 0.7 mm. It is present in samples THB 01, 05, 06, 22, 25, 29, 36, 49, 55, 60, 65, 67, 70, 78, 116, 119, 124.

Basalt/andesite; el & eq. sa-sr. < 1 mm, mode = 0.2 mm. This rock consists of randomly-orientated laths of plagioclase feldspar set in a fine-grained groundmass. The groundmass is altered in samples THB 33, 83, 116, 117, 124 where is appeared red (in XP) and yellow (in PPL). It is present in samples THB 24, 25, 33, 36, 49, 83, 116, 117, 119, 124.

Very Few to Absent:

Gneiss; el & eq. sa-sr. < 3.6 mm, mode = 1.2 mm. It consists of quartz, plagioclase feldspar and alkaline feldspar that show gneissic foliation. It is present in samples THB 06, 26, 31, 36, 45, 62, 67, 77, 80, 90, 100, 116.

Carbonate conglomerate; < 3 mm, mode = 2.4. This rock consists of randomly orientated minerals of quartz, feldspar, muscovite and biotite mica, a fine-grained brown and green inclusions, set in carbonate matrix. Borders are diffuse. It is present in samples THB 33, 45, 49, 91, 115, 116, 117.

Pyroxene: eq & el. sr-sa. < mm, mode = 0.1 mm. It is present in samples THB 06, 24, 45, 70, 71, 73, 80, 91, 123.

Rare to Absent:

Chert; el & eq. sr-sa. < 0.8 mm, mode = 0.6 mm. It is present in samples THB 47, 67, 90, 115.

Microcline; el & eq. sa-sr. < 0.4 mm, mode = 0.2 mm. It is present in samples THB 08, 22, 49, 67.

Very Rare to Absent:

Olivine-rich rock; el & eq. sa-sr. < 1 mm, mode = 0.7 mm. It consists of olivine (THB85) and quartz (THB 45). It is present in samples THB 45 and 85.

Matrix

75-80 %. The matrix is calcareous (THB 01, 08, 24, 27, 30, 31, 33, 45, 47, 50, 51, 61, 62, 66, 71, 75, 76, 78, 82, 83, 84, 85, 88, 89, 90, 91, 100, 115, 116, 117, 119, 48, 123, 124) to non-calcareous (THB 02, 05, 06, 21, 22, 25, 26, 29, 35, 36, 49, 55, 60, 65, 67, 68, 70, 72, 73, 77, 79, 80, 81, 98, 99, 111, 122). The colour is yellow-orange to red (in PPL and XP). The core-margin colour differentiation is present in samples THB25 (the core is grey while the margins are red), THB55 (one margin is yellow while the other margin is red), THB67 (one margin is yellow while the other margin is grey). The matrix is homogeneous and the only inhomogeneity refers to TFs. The secondary calcite is present in samples THB 02, 21, 25, 29, 36, 48, 51, 60, 62, 70, 71, 72, 75, 77, 78, 82, 83, 84, 88, 115, 116, 117, 123. The matrix is optically active.

Based on the texture and distribution of main inclusions, two types of slips can be distinguished. Slip A includes poorly- to moderately-sorted inclusions of quartz (Dominant) and mica (Common-Rare). It has porous texture. The matrix is non-calcareous, but in some samples the slip contains secondary calcite (THB 01, 26, 27, 36, 47, 62, 66, 68, 71, 82, 84). This type includes samples THB 01, 05, 21, 22,

26, 27, 30, 31, 36, 47, 49, 60, 61, 62, 66, 68, 70, 71, 72, 73, 78, 79, 81, 82, 84, 88, 89, 90, 91. Slip B is of clayey types, characterised by the fine texture, well-sorted and fine-grained inclusions that cannot be identified. They all include secondary calcite. The included samples are THB 33, 48, 115, 116, 119, 124.

Voids

5-10 %. Voids consist mainly of meso and macro vughs. The can be surrounded with micritic calcite (THB 29, 36, 61, 62, 71, 75, 79, 82, 84, 90, 117) or be part of micritic limestone (THB 47, 51, 62, 75, 80, 88, 91, 123). Mega vughs are present in samples THB 21, 31, 68, 71, 72, 78, 80, 83, 84, 88, 91, 100. Meso to macro channels are present in samples THB 51, 72, 73, 75, 76, 78, 117, 119. Meso to macro vesicles are present in samples THB 01, 06, 26, 31, 51, 66, 75, 78, 79, 81, 82. Plannar voids are present in samples THB61.

Comments

This is a heterogeneous fabric characterised by fine to medium-fine texture and mixture of inclusions of various origins set in the calcareous matrix. The fabric has consistent occurrence of mono- and polycrystalline quartz as well as metamorphic quartzite/schist. Another consistent inclusion is fine muscovite mica, but its distribution varies significantly across the fabric, from Common to Very Rare. The distribution of other inclusions varies in the samples of this fabric. The majority of samples contain limestone while some are characterised by fossiliferous limestone and carbonate conglomerate, all together counting for the majority of sedimentary rocks. In addition to quartzite/schist, other metamorphic rocks present in this fabric are mica schist, gneiss and serpentinite. The presence of these rocks suggest different processes of metamorphism in the environment used for the exploitation of clay, including a low- to medium- grade metamorphism and metasomatism. An igneous rock present in F1 is a fine-grained basalt/andesite. Inclusions of minerals biotite mica and plagioclase feldspar could be related to either igneous or sedimentary rocks. Therefore, the compositional variation together with alterations of inclusions suggest a degree of geological complexity in the environment that can be characterised as predominantly sedimentary. In this context, igneous and metamorphic rocks appear intermixed with sedimentary rocks. The optical activity of the matrix suggest that an approximate equivalent firing temperature was < 800-850 °C. The ceramics of this fabric were fired in an oxidising atmosphere.

Subgroup of Fabric 1

Samples: THB 44, 102, 104, 105, 107, 108 (n = 6)

Inclusions

15-25 %. el & eq. sr-sa. Single- to double-spaced. Moderate alignment to margins of sections. Bimodal grain size distribution.

Coarse fraction

45-50 %. 8.4-0.24 mm.

Dominant to Common:

Mica schist; el & eq. sr-sa. < 8.4 mm, mode = 2.2 mm. It consists of fine-grained quartz and muscovite mica that is altered and has brown colour in most of samples. It can include opaques (THB105) or olivine (THB102).

Frequent to Few:

Limestone; el & eq. sr-r. < 5.2 mm, mode = 0.8 mm. It consists of micritic limestone that can include voids.

Common:

Tfs; el & eq. sr-r. < 2.8 mm, mode = 0.8 mm. These are inclusions of brown to yellow colour (in PPL and XP), neutral to high optical density, neutral to high relief and sharp to merging borders. They may include fine quartz.

Common to Few:

Monocrystalline Quartz; el & eq. sa-sr. < 2.2 mm, mode = 0.6 mm.

Polycrystalline Quartz; el & eq. sa-sr. < 1.8 mm, mode = 0.8 mm. It consists of quartz crystals separated by straight boundaries.

Few to Absent:

Muscovite mica; el & eq. sr-sa. It is present in THB44.

Fine fraction

50-65 %. 0.24-0.01 mm.

Predominant:

Monocrystalline quartz; eq & el. sr-sa. < 0.24 mm, mode = 0.1 mm.

Matrix

70-75 %. The matrix is low-calcareous. The colour is orange to yellow in XP and yellow in PPL. The matrix is homogeneous and the only inhomogeneity relates to TFs. The secondary calcite is present in THB 102 and 105. The matrix is optically active.

Voids

5-10 %. They mainly consist of meso, macro and mega vughs that may have secondary calcite fringes (THB 44, 102, 108). Meso vesicles are present in THB102. Plannar voids are abundant in THB104.

Comments

This subgroup is distinguished from F1 because of bimodality, characterised by the contrast between coarse mica schist and limestone and fine monocrystalline quartz inclusions, set in a low calcareous matrix. The Predominant distribution of quartz in the fine fraction indicate its use as a temper. Another potential temper is coarse limestone considering the low calcareous nature of matrix. Dominant to Common inclusion is mica schist. The optical activity of the matrix suggest that an approximate equivalent firing temperature was < 800-850 °C. The ceramics of this fabric were fired in an oxidising atmosphere.

Fabric 2: Coarse with mica, schist and limestone

Samples: THB 10, 12, 15, 16, 17, 20, 28, 32, 53, 54, 56, 57, 69, 74, 87, 92, 93, 94, 96, 97, 101, 133 (n = 22).

Inclusions

20-30 %. el & eq. Single- to close-spaced. Weak alignment to margins of samples. Poorly to very poorly sorted inclusions. Weak bimodal grain size distribution.

Coarse fraction

35-50 %, 9-0.24 mm.

Dominant:

Monocrystalline quartz; el & eq. sr-sa. < 1.2 mm, mode = 0.6 mm.

Dominant to Common:

Muscovite mica; el & eq. sr-sa. < 3 mm, mode = 0.6 mm.

Frequent to Common:

Quartzite/schist; el & eq. sa-sr. < 5.4 mm, mode = 1 mm. This rock consists of quartz crystals which elongated axes tend to follow the same direction. Boundaries are sutured to straight. It can contain opaques (THB 69, 74), a fine brown inclusion (THB 12, 17, 34, 56, 69) and chlorite (THB 12, 34).

Common:

Limestone; el & eq. sr-r. < 9 mm, mode = 1.2 mm. Limestone is micritic and can contain muscovite mica, a fine brown inclusion and quartz (THB 12, 53, 54, 97, 133) as well as schist (THB53). It can include voids (THB 10, 12, 32, 53, 54, 56, 92, 97, 133) or be surrounded by them (THB56). Samples THB 32 and 97 contains limestone with relic fossiliferous structure.

Common to Absent:

Mica schist; el & eq. sr-sa. < 6 mm, mode = 2 mm. It has foliated structure, consisting of muscovite mica, quartz and a fine-brown inclusion. Mica schist is present in samples THB 12, 15, 17, 32, 34, 54, 56, 69, 74, 92, 97.

Gneiss; el & eq. sa-sr. < 5 mm, mode = 1.2 mm. It consists of quartz, plagioclase feldspar and alkaline feldspar that show gneissic foliation. Also present are a fine brown inclusion (THB 10, 34, 53, 92), mica (THB56) and chlorite (THB 32, 74). It is present in samples THB 10, 12, 15, 16, 17, 28, 34, 53, 54, 56, 57, 69, 74, 92, 133.

Few:

Polycrystalline quartz; el & rq. sa-sr. < 3 mm, mode = 1 mm. It consists of coarse quartz crystals with straight boundaries. It can include opaques (THB92), muscovite mica (THB 20, 34, 54, 97) and a fine-brown inclusion (THB69).

TFs 1; eq & el. sr-r. < 2 mm, mode = 0.8 mm. TFs are inclusions of dark red to brown colour (in PPL and XP), sharp to merging borders, high to neutral optical density relative to the surrounding matrix. Most of them have oval shape but some are elongated. They can include quartz and mica (THB 10, 12, 20, 28, 54, 56, 92).

TFs 2; el& eq. sr-r. < 9 mm, mode = 2.4 mm. They have high optical density, low relief and diffuse borders. They have abundant, well-sorted and close-spaced inclusions of monocrystalline quartz, muscovite mica and a fine-brown inclusion that have a different alignment than the rest of inclusions. The matrix of TFs 2 is of the same colour as the surrounding matrix, it is optically active and low-calcareous. In THB54, TFs 2 is associated with an inclusion of coarse limestone. They are especially abundant in THB69. They are present in THB 20, 34, 53, 54, 56, 69 and 93.

Plagioclase feldspar; el & eq. sr-sa. < 1.4 mm, mode = 0.8 mm.

Few to Absent:

Serpentine; el & eq. sr-r. < 0.8 mm, mode = 0.4 mm. It is present in samples THB 15, 17, 20, 32, 53, 74, 87, 92, 133.

Carbonate conglomerate; el & eq. sr-r. < 5 mm, mode = 0.8. This rock consists of randomly orientated minerals of quartz, feldspar, mica and a fine-grained brown inclusion set in carbonate matrix that is yellow in PPL and XP. Borders are diffuse. They can be surrounded by voids (THB74). It is present in samples THB 15, 34, 53, 54, 69, 74, 87 and 93. It is especially abundant in THB93.

Rare to Absent:

Biotite mica; el & eq. sr-sa. < 0.5 mm, mode = 0.4 mm. It is present in samples THB 15, 28, 87, 133.

Mudstone; el & eq. sr-r. < 9 mm, mode = 3 mm. This inclusion has clear boundaries, high relief and low optical density. It is made of fine clay particles without any other inclusions. The colour is orange in PPL and XP. Mudstone is present in THB 93 and 96.

Opagues; eq & el. sr-sa. < 0.9 mm, mode = 0.3 mm. It can include a fine brown inclusion (THB15). They are present in samples THB 15, 17, 20, 28, 34, 54, 56, 69, 74, 133.

Chert; el & eq. sr-sa. < 2.8 mm. mode = 0.6 mm. It is present in samples THB 15, 17, 32, 53, 54, 69.

Very Rare to Absent:

Microcline; el & eq. sa-sr. < 1 mm, mode = 0.6 mm. It is present in THB 15, 17, 53, 97.

Fine-grained volcanic rock; eq & el. sr-sa. < 1 mm, mode = 0.4 mm. This rock consists of randomly-orientated laths of plagioclase feldspar set in a fine-grained groundmass. It is present in THB 12, 53, 92.

Olivine-rich igneous rock; el & eq. sa-sr. < 1.6 mm, mode = 1 mm. This rock consists of olivine and quartz, and in one case pyroxene. It is present in THB 56, 93 and 97.

Fine fraction

50-65 %, 0.24-0.01 mm.

Dominant:

Monocrystalline quartz;

Muscovite mica;

Matrix

The matrix is micaceous and non-calcareous. The colour is yellow-orange-brown in XP and yellow-orange-grey-brown in PPL. The matrix is heterogeneous throughout sections and the inhomogeneity refers colour differentiations, TFs and streaked texture. The core-margin colour differentiation is present in several samples. Samples THB 17, 32, 56, 69, 87 and 92 have yellow/orange margins and brown/grey core (in PPL and XP); samples THB 10, 34 and 74 have one margin of yellow/orange and the other of brown/grey colour (in PPL and XP). Samples THB 17, 34, 53, 54, 93 and 96 have streaked texture in some parts of sections. The matrix is optically active.

Voids

5-10 %. Consisting mainly of macro and meso vughs and to lesser extent mega vughs. Meso vesicles are part of TFs (THB92) or fossiliferous limestone (THB97). Channels are present in THB 20, 32, 34, 53, 74, 87 and they can be part of limestone (THB10).

Comments

This fabric is characterised by the mixture of inclusions of various origins, bimodality of inclusions and micaceous matrix. Among inclusions, the presence of muscovite mica as well as quartz and quartz-rich rocks distinguishes this fabric. The most Common are metamorphic rocks, including quartzite/schist, mica schist and gneiss, which presence suggest the low-grade metamorphism in the environment used for the clay exploitation. Sedimentary rocks include carbonates, limestone and carbonate conglomerate. The mixture of inclusions suggests the exploitation of clay from a sedimentary environment. Another characteristic of F2 are traits that suggest clay mixing and tempering. The presence of TFs 2 indicates the clay mixing as they are characterised with specific set of inclusions that have alignment different to the surrounding matrix. Another indication of clay mixing are streaks present in some samples. The presence of coarse limestone in the low-calcareous matrix as well as quartz in the fine fraction could indicate tempering with these two types of rocks. In one sample (THB54), the association between coarse limestone and TFs 2 supports both practices. The optical activity of the matrix suggest that an approximate equivalent firing temperature was < 800-850 °C. The ceramics of this fabric were fired in an oxidising atmosphere, but the core-margin colour differentiation suggest uneven firing conditions.

Fabric 3: Medium-fine with mica

Samples: THB 04, 19, 23, 37, 58, 59, 64, 86, 95, 114, 118, 120, 121, 125 (n = 14).

Inclusions

15-20 %. el & eq. sr-sa. Single- to double-spaced. Moderate to strong alignment to margins of sections. Unimodal grain size distribution.

Dominant:

Muscovite mica; el & eq. < 1.6 mm, mode = 0.6 mm.

Dominant to Frequent:

Monocrystalline quartz; eq & el. sr-sa. < 0.8 mm, mode = 0.2 mm.

Common:

TFs; el & eq. sr-r. < 5 mm, mode = 1 mm. TFs are inclusions of dark red to brown colour (in PPL and XP), sharp to merging borders, high to neutral optical density relative to the surrounding matrix. They may include quartz and mica, be surrounded by voids (THB95) or include voids (THB125).

Limestone; el & eq. sr-r. < 3.2 mm, mode = 0.7 mm. Micritic limestone that is fossiliferous in some cases. It may contain quartz.

Plagioclase feldspar; el & eq. sa-sr. < 0.6 mm, mode = 0.14 mm.

Common to Absent:

Mica schist; el & eq. sr-r. < 4.4 mm, mode = mm. In some samples (THB 19, 86, 125), mica is partially altered and has brown colour. It is present in THB 19, 58, 64, 86, 118, 120, 121, 125.

Polycrystalline quartz; el & eq. sr-sa. < 3 mm, mode = 0.8 mm. It consists of coarse quartz grains separated with straight boundaries. It is present in THB 19, 58, 64, 114, 120, 121

Few to Absent:

Biotite; el & eq. sa-sr. < 0.3 mm, mode = 0.2 mm. It is present in samples THB 23, 95, 118, 125.

Gneiss; el & eq. sr-sa. < 1.4 mm, mode = 0.5 mm. It consists of quartz grains that show gneisses foliation. It is present in THB 19, 95, 121.

Very Rare to Absent:

Microcline; eq & el. sr-sa. < mm, mode = 0.2 mm. It is present in THB 23, 95.

Microcline-rich igneous rock; el & eq. sr-sa. < 1.2 mm, mode = mm. It consists of microcline and alkaline feldspars. It is present in THB86.

Calcareous conglomerate; el & eq. sr-r. < 3.4 mm, mode = 1 mm. It consists of quartz, feldspars and mica set in the calcareous matrix. It is present in THB86.

Granite?; el & eq. sr-sa. < 5.4 mm, mode = 2 mm. It consists of quartz and alkaline feldspar separated with straight boundaries. It is present in THB 64 and 121.

Chert; el & eq. sr-sa. < 1.2 mm, mode = 0.3 mm. It is present in THB 64 and 121.

Serpentine; el & eq. sr-r. < 1.4 mm. It is present in THB19.

Matrix

75 %. The matrix is non-calcareous and micaceous. The colour is yellow-orange-red in PPL and XP. The core-margin colour differentiation is present in THB 120 and 121; the margins are yellow-orange while the cores are dark brown (in PPL and XP). The matrix is homogenous and the only inhomogeneity relates to TFs. It is optically active.

Slip A is present in samples THB 64, 114 while Slip B is present in samples THB118, 125.

Voids

5-10 %. They consist mainly of meso to macro vughs. Channels are present in THB 64, 95, 114, 118, 120, 125. Meso vesicles are present in THB95.

Comments

This is a homogeneous fabric characterised by the medium-fine texture and inclusions of muscovite mica and quartz set in the micaceous matrix. Limestone, TFs and feldspar are consistent inclusions, while all others are present only in some of the samples. The mixture of inclusions of different origins

suggest the use of secondary clay. The matrix is homogenous and the only inhomogeneity relates to TF's. The optical activity of the matrix suggest that an approximate equivalent firing temperature was < 800-850 °C. The ceramics of this fabric were fired in an oxidising atmosphere.

Fabric 4: Fine with mica and quartz

Samples: THB 18, 38, 39, 40, 41, 46, 103, 106, 109, 110, 112, 113, 128, 130 (n=14).

Inclusions

5-15 %. el & eq. sr-sa. Single to double spaced. Moderate to strong alignment to margins of samples. Unimodal grain size distribution.

Frequent to Common:

Muscovite mica; el & eq. sr-sa. < 1.1 mm, mode = 0.5 mm.

Monocrystalline quartz; eq & el. sa-sr. < 2 mm, mode = 0.1 mm.

Common to Few:

TFs; el & eq. sr-r. < 2.4 mm, mode = 0.6 mm. They present inclusions of dark red-brown colour (in PPL and XP), sharp to merging borders, high to neutral optical density relative to the surrounding matrix. They are composed of optically active clay. Some TFs contain the inclusions of quartz and muscovite mica (THB 46, 103, 110, 112).

Few:

Polycrystalline quartz; el & eq. sa-sr. < 1.6 mm, mode = 0.4 mm. It consists of quartz crystals with straight boundaries. It can contain muscovite mica (THB34).

Few to Absent:

Limestone; el & eq. sr-r. < 1.4 mm, mode = 0.3 mm. Limestone is micritic. It can contain fine quartz (THB110). It is present in samples THB 18, 34, 38, 39, 41, 46, 103, 106, 110, 112, 113, 128.

Mica schist; el & eq. sa-sr. < 3 mm, mode = 1.2 mm. Mica schist consists of fine to coarse-grained quartz and muscovite mica minerals that show parallel alignment. In some samples (THB 38 and 46), mica is altered and has brown colour (in PPL and XP). It is present in samples THB 18, 34, 38, 39, 46, 112, 130.

Rare to Absent:

Plagioclase Feldspar; el & eq. sa-sr. < 1 mm, mode = 0.5 mm. It is present in samples THB 34, 39, 40, 46, 103, 109,

Very Rare to Absent:

Gneiss; el & eq. sa-sr. < 2 mm, mode = 1.2 mm. It consists of quartz and alkaline feldspar that show gneissic foliation. It is present in samples THB 39, 46.

Volcanic rock/fragments; eq & el. sa-sr. < 0.8 mm, mode = 0.7 mm. It consists of needle-shape crystals set in the glassy matrix. Some inclusions also contain brown crystals (in PPL and XP), probably related to serpentinisation. It can probably be identified as basalt/andesite. This rock is present in samples THB 34 and 39.

Matrix

80-88 %. The matrix is micaceous and non-calcareous. The colour is yellow-brown-grey in XP and yellow-brown in PPL. The colour differentiation is present in several samples. Samples THB 18, 39, 46, 103, 109 and 112 have yellow margins and brown-grey core (in PPL and XP). Samples THB128 is characterised by one margin of yellow-brown colour and the other margin of grey-brown colour (in PPL and XP). Sample THB38 contains yellow core while margins are brown and grey respectively (all colours in PPL and XP). Sample THB40 has three layers of different colours - the first is yellow, the second is brown and the third is grey (in PPL and XP). The matrix is homogeneous, with the only inhomogeneity is related to TFs and colour differentiation.

THB34 contains Slip A with abundant mica inclusions.

Voids

5-7 %. They mainly consist of meso to macro vughs as well as meso vesicles (THB 103, 112) and planar voids (THB46).

Comments:

This is a homogenous fabric characterised by the presence of muscovite mica and quartz set in the micaceous and non-calcareous matrix. In addition to polycrystalline quartz present in all samples, F4 contains inconsistent inclusions of sedimentary, metamorphic and igneous rocks which presence suggests that the clay was extracted from the sedimentary environment. Among sedimentary rocks limestone is present while metamorphic rocks include mica schist, gneiss and related feldspar. A volcanic rock is present in fragments, probably fine-grained basalt or andesite. TF's can be interpreted as naturally occurring clay pellets. In addition to TF's, the matrix shows inhomogeneity in terms of colour differentiation, pronounced for this fabric. Thin sections show differences between the core and margins as well as layers of different colours, all suggesting uneven firings conditions in an oxidising atmosphere. Based on the optically active matrix, an equivalent firing temperature was < 800-850°C.

Related to Fabric 4: sample THB127

Sample THB127 differs to F3 for the scarce presence of muscovite mica (Rare) and the absence of limestone. The sample is characterised by the presence of fine monocrystalline quartz (Frequent), TFs (Common), a fine-grained volcanic rock which can probably be identified as basalt (Very Few), biotite

mica (Rare) and a phaneritic igneous rock consisting of pyroxene, biotite, alkali and plagioclase feldspar that can probably be identified as gabbro (Rare). The texture remains the same as described for F3-unimodal grain size distribution with 10 % inclusions. The same refers to the matrix that is non-calcareous and micaceous, homogeneous, of yellow colour (in PPL and XP) and optically active.

Fabric 5: Coarse with granite and gneiss

Samples: THB 13, 14, 43 (n=3).

Inclusions:

30-40 %. el & eq. sa-sr. Single-spaced or less. Moderate to poor alignment to margins of sections. Unimodal grain size distribution.

Predominant-Dominant:

Monocrystalline quartz; el & eq. sa-sr. < 1.4 mm, mode = 0.5 mm.

Frequent to Common:

Polycrystalline quartz; el & eq. sa-sr. < 3.2 mm, mode = 1 mm. It consists of coarse quartz grains with straight boundaries. It can contain muscovite mica.

Common:

Granite; el & eq. sa-sr. < 3.6 mm, mode = 2 mm. It consists of quartz, alkaline, plagioclase and microcline feldspars.

Gneiss; el & eq. sa-sr. < 6 mm, mode = 1.6 mm. It consists of quartz that show gneissic foliation. It may include mica/altered mica.

Plagioclase feldspar; el & eq. sa-sr. < 2 mm, mode = 0.6 mm. Some inclusions are altered.

Common to Few:

Muscovite mica; el & eq. sr-sa. < 0.8 mm, mode = 0.6 mm.

Few:

Microcline; eq & el. sa-sr. < 1 mm, mode = 0.3 mm.

TFs; el & eq. sr-r. < 1.3 mm, mode = 0.6 mm. TFs are inclusions of dark red to brown colour (in PPL and XP), sharp to merging borders, high to neutral optical density relative to the surrounding matrix. It may include quartz, plagioclase and mica.

Rare to Absent:

Limestone; el & eq. sr-r. < 3.6 mm, mode = 1.6 mm. Micritic limestone may include quartz and mica. It is present in THB43.

Schist; el & eq. sa-sr. < 1.2 mm.

Matrix

55-60 %. The matrix is non-calcareous. Yellow to orange in PPL and XP. THB14 has the core-margin colour differentiation that refers to orange margins and darker core. The matrix is homogeneous and the only inhomogeneity relates to TFs. It is optically active.

Voids

5-10 %. They mostly consist of mega, macro and meso vughs. Channels are present in THB 04 and 14.

Comments

This coarse fabric is characterised by the presence of granite and gneiss set in the low-calcareous matrix. The fabric has abundant inclusions of mono- and poly-crystalline quartz. The optical activity of the matrix suggest that an approximate equivalent firing temperature was < 800-850 °C. Samples of this fabric were fired in an oxidising atmosphere, but the core-margin colour differentiation suggest uneven firing conditions.

Fabric 6: Coarse with andesite

Samples: THB 7 and 9 (n=2).

Inclusions

25-30 %. el & eq. sa-sr. Single to double spaced. Moderate alignment to margins of sections. Unimodal grain size distribution.

Dominant to Frequent:

Plagioclase feldspar; el & eq. sa-sr. < 1.2 mm, mode = 0.6 mm.

Frequent to Common:

Monocrystalline quartz; el & eq. sa-sr. < 1.6 mm, mode = 0.4 mm.

Hornblende; el & eq. sa-a. < 1.4 mm, mode = 0.4 mm.

Common to Few:

Andesite; el & eq. sa-sr. < 2.8 mm, mode = 0.6 mm. It consists of phenocrysts of feldspar and hornblende set in a fine-grained groundmass.

Limestone; el & eq. sr-r. < 1 mm, mode = 0.6 mm. Micritic limestone.

Mica schist; el & eq. sr-sa. < 1.4 mm, mode = 0.5 mm. It may include opaques.

TFs; el & eq. r-sr. < 2.2 mm, mode = 0.8 mm. These are inclusions of deep red to brown colour (in PPL and XP), high to neutral relief and sharp to merging boundaries. They may include quartz and fine mica.

Gneiss; el & eq. sa-sr. < 2 mm, mode = 0.7 mm. It may include opaques.

Matrix

65 %. The matrix is non-calcareous. The colour is orange to red in PPL and XP. The matrix is homogenous and the only inhomogeneity relates to TFs. It is optically active.

Voids

5-10 %. They consist mostly of meso to macro vughs. Channels are present in THB7.

Comments

This is a homogenous fabric, characterised by the coarse inclusions of plagioclase feldspar, hornblende and andesite set in the non-calcareous matrix. In addition to the volcanic rock andesite, the fabric has inclusions of metamorphic rocks mica schist and gneiss. Limestone is also present, as the only sedimentary rock. The matrix is non-calcareous while the optical activity suggests that the equivalent firing temperature is < 800-850°C.

Fabric 7: Very fine with quartz

Sample: THB03 (n=1).

Inclusions

5-7 %. eq & el. sr-r. Single to open space. Moderate to strong alignment to margins of sections. Unimodal grain size distribution.

Frequent:

Monocrystalline quartz; eq & el. sr-r. < 0.4 mm, mode = 0.1 mm.

Very Rare:

Limestone; el & eq. sr-r. < 2.2 mm.

Serpentine; el & eq. sr-r. < 0.7 mm.

Matrix

88 %. The matrix is low calcareous. The colour is orange in PPL and XP. The matrix is homogeneous and optically active.

Voids

5-7 %. They consist of meso and macro vughs.

Comments

This is a homogeneous fabric characterised by fine quartz set in a low-calcareous matrix. The optical activity of matrix suggests that the equivalent firing temperature was < 800-850°C.

Fabric 8: Very fine with quartz and opaques

Sample: THB131 (n=1).

Inclusions

7-10 %. eq & el. sr-r. Single to open space. Moderate alignment to margins of sections. Unimodal grain size distribution.

Dominant:

Monocrystalline quartz; eq & el. sr-r. < 0.5 mm, mode = 0.14 mm.

Common to Few:

Opaques; eq & el. sr-r. < 0.14 mm, mode = 0.1 mm.

Matrix

85-86 %. The matrix is non-calcareous and homogenous. The colour is green to yellow in XP and yellow in PPL. It is optically active.

Voids

5-7 %. They consist of planar voids.

Comments

This homogenous fabric characterised by fine inclusions of quartz and opaques set in a non-calcareous matrix. The optical activity of matrix suggests that the equivalent firing temperature was < 800-850°C.

Fabric 9: Medium-fine with quartz and limestone

Sample: THB42 (n=1).

Inclusions

25-30 %. el & eq. sr-sa. Moderate to poor alignment to margins of sections. Unimodal grain size distribution.

Predominant:

Monocrystalline quartz; el & eq. sr-sa. < 1 mm, mode = 0.3 mm.

Frequent;

Limestone; el & eq. r-sr. < 1 mm, mode = 0.7 mm. Micritic limestone that contain voids.

Common to Few:

Plagioclase feldspar; el & eq. sa-sr. < 0.4 mm, mode = 0.2 mm.

Few:

TFs; eq & el. sr-r. < 1.2 mm, mode = 0.8 mm. These are brown inclusions (in PPL and XP) with high relief and straight to merging borders. They can include voids or be surrounded by voids.

Rare:

Polycrystalline quartz; el & eq. sa-sr. < 1.2 mm, mode = 0.5 mm. It consists of coarse quartz grains with straight boundaries.

Matrix

63-65 %. The matrix is calcareous. The colour is green in XP and yellow in PPL. It is homogenous and the only inhomogeneity relates to TFs. The matrix is optically inactive.

Voids

7-10 %. They consist of meso and macro vughs. The majority of voids are associated with limestone.

Comments

This is a homogenous fabric characterised by inclusions of quartz and limestone set in a calcareous matrix. The matrix is optically inactive, which is indicative of equivalent firing temperature of >800–850°C.

Fabric 10: Medium-fine with quartz

Sample: THB63 (n=1).

Inclusions

20-25 %. el & eq. sa-sr. Single to double spaced. Moderate alignment to margins of sections. Unimodal grain size distribution.

Dominant:

Monocrystalline quartz; el & eq. sa-sr. < 0.8 mm, mode = 0.14 mm.

Common to Few:

Polycrystalline quartz; el & eq. sa-sr. < 0.6 mm, mode = 0.2 mm.

Few:

Mica schist: el & eq. sr-sa. < 0.6 mm.

Very Rare:

Limestone; el & eq. sr-r. < 1.6 mm.

Matrix

70 %. The matrix is low calcareous. The sample shows a core-margin colour differentiation; the core is grey in PPL and XP while margins are orange in PPL and XP. It is optically active.

Voids

5-10 %. They consist of meso and macro vughs.

Comments

F10 is a homogeneous fabric, characterised by inclusions of mono and poly-crystalline quartz set in a low calcareous matrix. The matrix is optically active, which suggests that the equivalent firing temperature was < 800-850°C. The grey colour of matrix indicates a reducing firing atmosphere, but the core-margin colour differentiation suggests uneven firing conditions.

Fabric 11: Coarse with schist

Sample: THB11 (n=1)

Inclusions

30-35 %. el & eq. sa-sr. Single-spaced or less. Moderate to strong alignment to margins of sections. Weakly bimodal grain size distribution.

Coarse fraction:

50-60 %, 4.2-0.24 mm.

Dominant to Frequent:

Schist/mica schist; el & eq. sa-sr. < 4.2 mm, mode = 1.2 mm. It consists of quartz and muscovite mica, but may include opaques.

Frequent:

Monocrystalline quartz; el & eq. sa-sr. < 1.2 mm, mode = 0.8 mm.

Common:

Limestone; el & eq. sr-r. < 1.2 mm, mode = 1 mm. Micritic limestone that includes voids.

Few:

Polycrystalline quartz; el & eq. sa-sr. < 1.2 mm, mode = 0.8 mm. It consists of quartz grains separated with straight boundaries.

Plagioclase feldspar; el & eq. sa-sr. < 0.7 mm, mode = 0.6 mm.

Rare:

Serpentine; el & eq. sr-r. < 1.8 mm, mode = 0.8 mm.

Chert; el & eq. sr-sa. < 1.3 mm, mode = 0.8 mm.

Granite? el & eq. sr-sa. < 1 mm, mode = 1 mm. It consists of quartz, plagioclase and alkaline feldspars.

Fine fraction

40-50 %, 0.24-0.01 mm.

Monocrystalline quartz;

Matrix

40-63 %. The matrix is non-calcareous. The colour is yellow to brown in PPL and XP. The matrix is homogeneous. Weak optical activity.

Voids

5-7 %. They consist of meso and macro vughs. They can have calcareous fringe.

Comments:

This fabric is characterised by coarse and single-spaced inclusions of schist/mica schist set in the low- to non-calcareous matrix. The matrix is optically active, which suggests that the equivalent firing temperature was < 800-850°C.

Fabric 12: Fine with quartz and mica

Sample: THB132 (n=1)

Inclusions

10-15 %. el & eq. sa-sr. Double-spaced. Moderate alignment to margins of sections. Unimodal grain size distribution.

Dominant:

Monocrystalline quartz: el & eq. sa-sr. < 0.4 mm, mode = 0.1 mm.

Common:

Muscovite mica; el & eq. sa-sr. < 0.3 mm, mode = 0.2 mm.

Matrix

77-80 %. The matrix is non-calcareous and micaceous. The colour is yellow to grey to brown in PPL and XP. The distinct colour differentiation refers to layers of different colours, ranging from yellow-brown to grey. It is optically active.

Voids

3-5 %. They consist of meso vughs.

Comments

This is a fine fabric characterised by the inclusions of fine quartz set in micaceous matrix. The matrix is optically active, which suggests that the equivalent firing temperature was < 800-850°C, but the colour differentiation suggest uneven firing.

Fabric 13: Coarse with mica

Sample: THB52 (n=1)

Inclusions

25-30 %. el & eq. sr-a. Single- to double-spaced. Moderate alignment to margins of sections. Unimodal grain size distribution.

Dominant:

Monocrystalline quartz; el & eq. sa-a. < 1.3 mm, mode = 0.6 mm.

Frequent:

Polycrystalline quartz; el & eq. sa-a. < 2.4 mm, mode = 0.4 mm. It consists of quartz grains separated with straight boundaries. Can contain muscovite mica.

Muscovite mica; el & eq. sa-sr. < 2.4 mm, mode = 1 mm.

Few:

TFs; el & eq. sr-r. < 1.4 mm, mode = 0.4 mm. These are inclusions of dark brown colour, high relief, low optical density, clear to merging boundaries. They can contain quartz.

Plagioclase feldspar; el & eq. sa-sr. < 0.6 mm, mode = 0.6 mm.

Very Rare:

Microcline feldspar; el & eq. < 0.6 mm.

Matrix

63-65 %. Non-calcareous and micaceous. The colour is yellow in PPL and XP. Margins of sections may be separated from the core with voids, and they contain more inclusions of quartz and mica than the core. The only inhomogeneity relates to TFs. It is optically active.

Voids

7-10 %. They consist of meso and macro vughs.

Comments

This fabric is characterised by inclusions of quartz and muscovite mica set in the non-calcareous matrix. The margins contain more inclusions than the core and they may be separated by voids. The matrix is optically active, which suggests that the equivalent firing temperature was < 800-850°C.