

Supplementary Material



Table S1: Available information about the tested materials considered in this paper. Mineralogical and textural characteristics of the materials used by the different Authors for obtaining the thermal conductivity and referred to in the present paper for comparison with our results. Qz: quartz; Pl: Plagioclase; Or: Orthoclase; Px: Pyroxene; Kln: Kaoline.

bulk density	mineralogy	grain size
		gravel / sand / silt / clay [%]
Roshankhah et al. (2020) [39]		
1693	>90% Qz	graded quarzitic sand (D50 = 300 μm)
1575	99% Qz	silica flour (D50 = 20 μm)
Chen (2008) [26]		
	99% Qz	uniform medium sand
	99% Qz	uniform coarse sand
	99% Qz	uniform silty sand
	99% Qz	well graded medium sand
Abu-Hamdeh et al. (2001) [41]		
1060-1430		– / 95.75 / 4.15 / 0.10
1180-1410		– / 75 / 9 / 16
1200-1410		– / 40 / 36 / 24
1100-1490		– / 21-4 / 39 / 39.6
Abu-Hamdeh & Reeder (2000)		
1250-1600		– / 95 / 4 / 1
1210-1400		– / 75 / 9 / 16
1250-1400		– / 40 / 36 / 24
1320-1500		– / 21 / 39 / 40
Nusier and Abu-Hamdeh (2003) [1]		
1250-1460		– / 95 / 4 / 1
1250-1460		– / 40 / 35 / 25
Barry Macaulay et al. (2013) [43]		
1150-1500	50-66% Qz, 3-5% Or, 3-18 Kln, 2-10 smectite	fine grain soils (< 21% sand)
1300-1800	63-92% Qz, 8-33% Kln	coarse grain soils (> 60% sand)
Lu et al. (2007) [11]		
1290		– / 32 / 38 / 30
1200		– / 2 / 73 / 25
1380		– / 50 / 41 / 9
1580		– / 92 / 7 / 1
Farouki (1981) [18]		
	43.1% Qz; 11.6 Or; 12: Pl; 27% Px; 5.4% others	80 / 19.4 / 0.3 / 0.3
	15->95% Qz; 10-30% Or; 13-50% Pl; 27-34% Px; others	0-27 / 63-99 / 2-5 / 2-5
	59->99% Qz; 3.6-20,5% Or; 5.3-9% Pl; others	0-27 / 0-99 / 0-3 / 0-3
	12% Qz; 7% Or; 18% Pl; 12% Px; others	0 / 97 / 3 / 0
	4.6-13.3% Qz; 0-2% Px; 28.3-28.9% Kln; others	1-11 / 54-58 / 21-28 / 10-19
	22% Qz; 55% Kln	0 / 2 / 20 / 78
Johansen (1975) [24]		
2600-2850	39-100% Qz	sand
2700-3000	2-57% Qz	gravel
2130-3000	2-33% Qz	crushed rock
2800	22% Qz	clay
Kersten (1949) [17]		
1750	>95% Qz	crushed quartz (15 / 79 / 0-5 / 0-5)

1900	20% Qz; 30% Or; 40% Pl; 10% others	crushed granite (16 / 77 / 0-7 / 0-7)
1650	3% Qz; 10% Or; 50% Pl; 34% Px; 3% others	crushed trap rock (27 / 63 / 0-10 / 0-10)
1800	72% Qz; 20% Or; 3% Px; 5% others	Lowell sand (0 / 100 / 0 / 0)
1700	59% Qz; 13% Or; 12% Px; 12% Kln; 4% others	Dakota Sandy Loam (11 / 58 / 21 / 10)
1500	13% Qz; 28% Kln; 18% mica	Fairbanks Silt Loam (0 / 8 / 81 / 11)
present research		
1430-1630	>90% Qz , >5% carbonate, <5% others	intermediate Po River sands (5 / 95 / 0 / 0)
1000-1300	>90% Qz , <5% carbonate, <5% others	lower Po River silty-clay (0 / 5 / 90 / 5)