

Correlation of Pliocene garnet tephra from the Koto deep observatory well, Tokyo, Japan

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The garnet-bearing tephra layer (KT1217 tephra) has been found from the Koto deep drilling core-1217m. The KT1217 tephra interbedded silty mudstone of the Kazusa Group and is composed of fib, sp, sb type glass shard, plagioclase, quartz, garnet, hornblende, biotite and opaque minerals. The refractive index (RI) of volcanic glass is 1.503-1.505 and the RI of hornblende is 1.688-1.695. The chemical composition of garnet is $X_{Fe}=0.54-0.57$, $X_{Mn}=0.19-0.23$, $X_{Mg}=0.14-0.16$, $X_{Ca}=0.07-0.08$. The age of KT1217 is estimated at about 2.5Ma based on the stratigraphical biohorizons situated at CN12b-CN12c zone by Okada and Bukry(1980), NPD9 zone by Yanagisawa and Akiba(1998) and N.21 zone (Yanagisawa et al., 2006).

Three Pliocene tephra layers abundant in garnet are known; Mk19 tephra(Mk19: Nakatsu Formation in Sagami area), KGP tephra(KGP: Kazusa Group in Kamakura area) and Na-G tephra(Na-G: Inubo Group in Choshi area) in the southern Kanto area. These garnet tephra layers are almost the same age at 2.5Ma. Additionally, the mineral composition, refractive indices of volcanic glass and hornblende, and chemical composition of garnet phenocryst of MK19, KGP and Na-G are all same. Accordingly, these garnet tephra layers are correlated (Tamura et al., 2007). The KT1217 tephra is correlated with these garnet tephra by petrographic properties and age. This garnet tephra will play an important role in reconstructing the geological structure beneath the Metropolitan area, Japan.