A key piece of information to forecast a volcanic eruption are the time scales of processes that occur in magma reservoir and conduit. Banded pumices with two contrasting magmas provide a unique opportunity to gain temporal insights into the processes involved in eruption triggering (magma mixing). We started a petrologic and geochemical study of a suite of banded pumices from Gede Volcano.

The mafic layer consists of phenocrysts of calcic plagioclase, clinopyroxene (Mg# 77), orthopyroxene (Mg# 74), and olivine (Fo 72). Those of the felsic zones are sodic plagioclase, and orthopyroxene (Mg# 61). The felsic magma also contains re-equilibrated xenocrysts – “inherited” from the mafic magma – of clino- (Mg# 68) and orthopyroxene (Mg# 61), and calcic plagioclases with Na-rich rim. There are also major differences in the matrixes: the mafic one is rich in plagioclase and pyroxene microlites, whereas the felsic matrix consists of mainly glass and vesicles. The textures and mineral compositions show evidences for both pre- and syn-eruptive mixing and mingling. Two-pyroxene geothermometry gives similar temperatures for both magmas at about 1000 °C. We interpret the contrasting matrixes as the result of cooling of the mafic magma that heated the felsic one. Preliminary modeling of Fe-Mg zoning of orthopyroxene indicates that the maximum time since interaction between the two magmas and eruption was about 3-6 months. This time frame is short enough for the mafic magma to have triggered the eruption and, thus it probably reflects the pre-eruptive mixing stage.