The activity of Shirataka volcano (0.9-0.7 Ma) is divided into strato-cone building, pyroclastic-explosion, and lava-dome forming stages. We examined second stage products and revealed these were formed by synchronized eruption of multiple magma chambers.

Previous petrologic studies on first and third stages revealed all products were formed by mixing between mafic and felsic end-members, and both changed their compositions temporally. Juvenile fragments of the second stage are pumices with minor scoriae, possessing petrologic features of two end-members mixing origin. The end-member compositions of scoriae would be the same as in the third stage, because bulk compositions of scoriae fall in the range of third stage products. Whereas, pumices show higher Zr, Hf, U, Th contents than any other products of Shirataka volcano. Petrologic examinations showed compositions of mafic and felsic end-members of pumices were in the range of first stage products, except for higher Zr, Hf, U, Th contents of felsic end-members.

Mafic and felsic end-members of first stage products would be re-activated at the second stage by the ascent of mafic end-members of scoriae, which is regarded as precursory activity of third stage. The higher Zr, Hf, U, Th contents of felsic end-members of pumices can be explained by melting of accessory zircons with thorite inclusions during re-activation. Felsic end-members of scoriae would be formed by re-melting of relevant mafic end-members. Further ascent of mafic end-members of scoriae triggered synchronized eruption of end-member magmas of pumices and scoriae, resulted in the formation of mixed pumices and scoriae.