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Tectonites in the Shear Zone Array of the Tongbai–Dabie Orogenic Belt

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A series of tectonites were formed in the shear zone array of the Tongbai–Dabie Orogenic Belt, including mylonites, blastomylonites, semi-plastic mylonites and foliated cataclasites as a result of multiple strain localization, strain softening and deformation partitioning. The mylonitic rocks are characterized by a two-phase mylonitic structure, or an interconnected weak matrix or layer (IWL) structure formed by separating clasts or boudins of the stronger phase by interconnected weaker phase matrix or layers. Various kinds of microstructures are found in the tectonites. The assemblage and evolution trend of the microstructures are controlled by the variation, alternation and transition of the dominant deformation mechanisms in different environments. The variation in chemical composition of the rocks from a typical shear zone is presented. The enrichment of immobile elements, such as Ti, P, Zr, V and Y, in the mylonites and ultramylonites is interpreted as being due to volume loss of the tectonites. The volume loss is estimated by mass balance calculations, based on the variation of element chemistry. The calculation also indicates the loss of large amounts of SiO_2 and infiltrated fluids. The large volume loss and fluid flow play a very important role for the chemical and rheological behaviours of the rocks in the shear zones.