

消磁によるレスの磁気構造の変化

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Mapping of loess magnetic fabric changes by demagnetization experiments

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The behavior of the magnetic fabric of loess and paleosol pilot samples, originated from Hungarian succession, were studied by anisotropy of magnetic susceptibility (AMS) measurements during stepwise alternating field demagnetization (AFD) and isothermal remanent magnetization (IRM) experiments. The same samples were measured 10 times in every demagnetization step. The magnetic experiments were completed by scanning electron microscope (SEM) investigation.

The changing of the magnetic susceptibility (k), the replacement of the maximum (k_{max}) and intermediate susceptibilities (k_{int}) and 45-120 deg. change in the orientation of the k_{max} were observed. The change of some AMS parameter, such as the shape of the magnetic susceptibility ellipsoid (T) was also notified. Besides the change of the T , no characteristic change of the degree of AMS (P) were observed.

In materials with low magnetic susceptibility, such as loess, the appearance of paramagnetic phyllosilicates (e.g. muscovite, chlorite) can be responsible for the possible replacement of the k_{max} and k_{int} , which is possibly controlled by the crystallographic anisotropy of the phyllosilicates.

The flipping and the instability of the fabric orientation and also the change of the k possibly indicate the transformation of the domain structure of various magnetic components. This change is possibly indicated by the change of T also.

The behavior of the loess magnetic fabric, suggested above, draws attention to the difficulties of the magnetic fabric analysis. More care must be taken during the determination of the paleowind direction by the orientation of the k_{max} in the future studies of loess, when 45-120 deg. differences of the paleowind direction, triggered by crystallographic anisotropy and the change of the domain structure, could indicate absolutely different paleoenvironmental condition.