

Cautionary note on magnetic analysis using magnetic separation

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In most paleomagnetic studies of marine sediments, bulk sediments and/or magnetic extracts have been magnetically investigated for identifying magnetic carriers. The magnetic minerals of great saturation magnetization value, such as magnetites of large grain size, are possibly extracted advantageously during magnetic separation and its magnetic properties tend to be focused inevitably, whereas minor magnetic minerals are possibly lost in extracting of magnetic minerals and its magnetic properties might be vanished by dilution with majorities of magnetic fractions in bulk sediments. This study presents an example of disagreement in magnetic properties between magnetic extracts, residual sediments and bulk sediments, which indicates that the magnetic extracts should not be considered as a direct representation of all magnetic contents in the sediments. Because minor magnetic minerals can provide specific information about sedimentary environments in some cases, the magnetic measurements thus should be conducted carefully not only on magnetic extracts but on residual sediments after magnetic separations in order to gain a better understanding of sedimentary environments.