

DOLOMITES OF THE MUHU FORMATION (SILURIAN, ESTONIA): ASPECTS OF DOLOMITIZATION

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The dolomites of the Muhu Formation originate from shallow-water calcareous sediments, formed in the marginal part of the gulf-like pericratonic sea during the middle Wenlock regression. Dolomitization has destroyed skeletal remains, changed the composition, but the lithological variety of rocks has preserved. The comparative analysis of the chemical composition and X-ray diffractometry showed no relationship between dolomite stoichiometry and rock type. The molar ratio of $\text{CaCO}_3/\text{MgCO}_3$ does not depend on the content of insoluble residue and it is very close to the theoretic of mineral dolomite. The d_{104} value of dolomites (2.8850-2.8856 Å) equals the limit between the ideal and normal dolomite being the lowest registered so far. In this respect the dolomites of the Muhu Formation represent the most completely dolomitized part of the extensive body of Silurian dolomites that cross-cuts facies. The dolomitization has rearranged the total porosity. In general it has increased, but the correlation with the content of the insoluble residue is less distinctly linear than in case of comparable limestones. The total porosity of the purest rocks has increased by 4-5%, that of the argillaceous dolomite by 1-2%, and the dominating value of the total porosity is between 6% and 9%. In all likelihood, the dolomitization began in the Silurian, soon after the deposition. The palaeokarst cavities, devoid of small idiomorphous crystals, met in some drill cores on the corroded surface of the Silurian-Devonian boundary suggest that the dolomitization process might have almost ended before the early Devonian subareal period.