The conditions and timing of carbonate cementation in Cambrian sandstones of the Baltic sedimentary basin were determined by oxygen and carbon stable isotope and chemical data in combination with optical and cathodoluminescence petrographic studies. Studied samples represent a range in present burial depth from 340 to 2150 m. The carbonate cement is dominantly ferroan dolomite that occurs as dispersed patches of poikilotopic crystals. Temperatures of dolomite precipitation, based on delta O-18 values, range from 27 degrees C in the shallow buried to 95 degrees C in the deep buried sandstones. The burial history modelling points to development of most of the dolomite cement during rapid Silurian-Devonian subsidence and Carboniferous-early Permian uplift. A wide range of precipitation temperatures indicate that temperature was not a major factor in triggering the carbonate cementation. Dolomite precipitation is related to early stages of organic matter maturation and thus to the oil generation history in the basin. delta C-13 values vary from +0.03% to -6.2% (PDB), suggesting limited addition of carbon from an organic source, with the major part derived from marine bicarbonate. The sourcing of carbon from the organic-rich Cambrian shales is identified from the distribution of delta C-13 values in the dolomite cement within the Cambrian section. The chemical composition of the dolomite cement shows a depth-controlled trend that is coincident with the present-day hydrochemical zonation of the Cambrian aquifer. The increase in the Fe content of the dolomite towards the deeper buried part of the Baltic basin is related to increasing sourcing of ions (Fe and Mg) from adjacent shales.

General information
State: Published
Organisations: Department of Environmental Engineering
Contributors: Sliaupa, S., Cyziene, J., Molenaar, N., Musteikyte, D.
Pages: 27-41
Publication date: 2008
Peer-reviewed: Yes

Publication information
Journal: Acta Geologica Polonica
Volume: 58
Issue number: 1
ISSN (Print): 0001-5709
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.05 SJR 0.68 SNIP 0.788
Web of Science (2017): Impact factor 1.085
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.15 SJR 0.529 SNIP 0.834
Web of Science (2016): Impact factor 0.917
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.4 SJR 0.705 SNIP 0.94
Web of Science (2015): Impact factor 0.981
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 0.74 SJR 0.406 SNIP 0.742
Web of Science (2014): Impact factor 0.839
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 0.87 SJR 0.433 SNIP 0.891
Web of Science (2013): Impact factor 0.804
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 1.43 SJR 0.776 SNIP 1.495
Web of Science (2012): Impact factor 1.133
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 0.84 SJR 0.577 SNIP 0.761
Web of Science (2011): Impact factor 0.565
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.489 SNIP 0.882
Web of Science (2010): Impact factor 0.779
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.404 SNIP 0.746
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.577 SNIP 1.206
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.99 SNIP 1.587
Scopus rating (2006): SJR 0.705 SNIP 1.148
Scopus rating (2005): SJR 0.553 SNIP 0.754
Scopus rating (2004): SJR 0.53 SNIP 1.477
Scopus rating (2003): SJR 0.418 SNIP 0.848
Scopus rating (2002): SJR 0.517 SNIP 1.115
Scopus rating (2001): SJR 0.505 SNIP 1.083
Scopus rating (2000): SJR 0.182 SNIP 1.004
Scopus rating (1999): SJR 0.219 SNIP 0.443
Original language: English
Keywords: ferroan dolomite cement, Baltic basin, stable isotopes, Cambrian sandstones
Source: orbit
Source-ID: 221588
Research output: Research - peer-review › Journal article – Annual report year: 2008