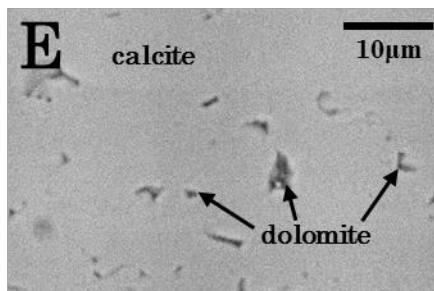
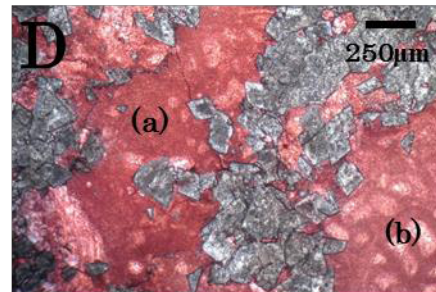
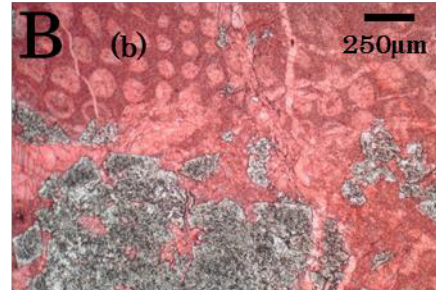
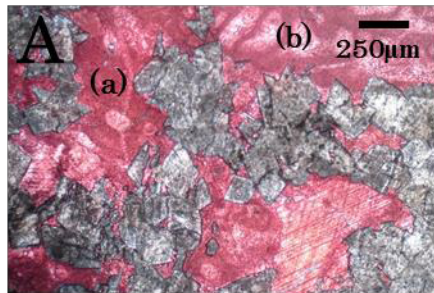


## Supplementary Materials

Fig. S1. Photomicrographs (A-D) and SEM backscatter electron image (E) of the dolomitic limestones.



A and E: SO-1, B: FB-1, C: KZ-1, D: KZ-2  
A-D: stained by Alizarin red  
Red: calcite, Gray: dolomite  
(a): lime-mud, (b): fossil  
E: dolomite disseminated in calcite

Table S1. Major and trace element concentrations obtained from dolomitic limestone samples.

	SO-1		FB-1		KZ-1		KZ-2	
Locality	Shiori (Shiga prefecture, Japan)		Iodo (Gifu prefecture, Japan)		Kuzuu (Tochigi prefecture, Japan)		Kuzuu (Tochigi prefecture, Japan)	
Formation			Funabuseyama formation		Nabeyama formation		Nabeyama formation	
Reference			Sano (1988)		Minoura (1992)		Minoura (1992)	
Age	Permian		Permian		Permian		Permian	
Dolomite content (%) <sup>*</sup>	10		33		54		46	
HCl residue (%)	0.35		0.15		2.3		0.3	
Treatment	0.5M-AcA	0.5M-HCl	0.5M-AcA	0.5M-HCl	0.5M-AcA	0.5M-HCl	0.5M-AcA	0.5M-HCl
ppm in solution								
Ca	4000	1240	2035	1389	2279	2368	2639	2418
Mg	28	635	38	717	124	1241	109	1223
Ca/Mg (mol/mol)	87.9	1.18	32.5	1.17	11.1	1.16	14.7	1.20
ppm in solid <sup>**</sup>								
Mn	23	69	4	16	19	23	26	37
Fe	84	1662	B.D.	117	44	181	79	403
Al	72	128	80	142	74	97	67	85
P	B.D.	792	B.D.	189	B.D.	615	B.D.	360
La	1.30	1.02	2.25	0.87	4.18	2.32		6.78
Ce	0.66	0.72	0.70	0.33	0.71	0.50	1.75	1.81
Nd	0.80	1.15	1.17	0.68	2.16	1.63	3.56	4.40
Sm	0.18	0.30	0.20	0.13	0.39	0.32	0.60	0.86
Eu	0.04	0.06	0.04	0.03	0.09	0.07	0.11	0.15
Gd	0.25	0.40	0.26	0.20	0.58	0.50	0.76	1.09
Dy	0.23	0.31	0.26	0.19	0.61	0.50	0.70	0.88
Er	0.16	0.20	0.18	0.14	0.46	0.40	0.47	0.60
Yb	0.11	0.13	0.11	0.08	0.40		0.30	0.36
Lu	0.02	0.02	0.02	0.01	0.06	0.05	0.05	0.05

B.D.: Below detection limit.

<sup>\*</sup> The values were estimated from dissolved calcite and dolomite amounts in 0.5M-AcA and 0.5M-HCl solution.<sup>\*\*</sup> The dissolved solid amounts were calculated using Ca and Mg concentrations in 0.5M-AcA and 0.5M-HCl solution (see Subsection "Natural dolomitic limestones").