

**Table 1** Schmidt Hammer values for selected rock types

Material	Mean R value	Source
<b>Limestones</b>		
Calcrete hardpans	42	Day and Goudie (1977)
Calcrete on chalk (Israel)	51–4	Yaalon and Singer (1974)
Travertines (Turkey)	35.2–57.0	Kahraman <i>et al.</i> (2004)
Chalk (Israel)	14	Yaalon and Singer (1974)
Maresha Chalk (Israel)	23.9	Katz <i>et al.</i> (2000)
Middle Chalk (UK)	20.0	Goudie <i>et al.</i> (1989)
Upper Chalk (UK)	9.0	Goudie <i>et al.</i> (1989)
Limestone aeolianite (Bahrain)	14.5	Day and Goudie (1977)
Calcarenite (Lord Howe Island)	19.8–28.6	Dickson <i>et al.</i> (2004)
Wind abraded dolomite (Bahrain)	50	Day and Goudie (1977)
Puerta Rico Aymamon limestone, unweathered	12.5	Day (1980)
case hardened	53.4	Day (1980)
Yucatan, Mexico, unweathered (Carillo Puerto)	35.9	Day (1980)
Browns Town (Jamaica)	32.1	Day (1980)
Montpelier Limestone (Jamaica)	20.50	Lyew-Ayee (2004)
Troy Formation (Jamaica)	41.87–55.23	Lyew-Ayee (2004)
Moneague Formation (Jamaica)	43.67–44.57	Lyew-Ayee (2004)
Chapelton Formation (Jamaica)	38.04–38.74	Lyew-Ayee (2004)
Somerset Formation (Jamaica)	41.76	Lyew-Ayee (2004)
Dolomitic Peten (Guatemala)	39.7	Day (1980)

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**Table 1** Continued

Material	Mean R value	Source
Dolimitic (Belize)	39.8	Day (1980)
Melinau limestone (Mulu, Sarawak)	56.4	Day (1980)
Gunong Api pinnacle limestone (Mulu)	61.9	Day (1980)
Limestone with pinnacles (Mallorca)	52.7	Day and Goudie (1977)
Pliocene (Barbados)	29.8	Day (1982)
Miocene (Guadeloupe)	33.4	Day (1982)
Antigua formation (Antigua)	33.3	Day (1982)
Ceyhan (Turkey)	53.25	Yaşar and Erdoğn (2004)
Antique Cream	51.55	Yaşar and Erdoğn (2004)
Miocene oolitic (Budapest, Hungary)	18–23	Török (2003)
Cordoba Cream (Texas)	41.5	Katz <i>et al.</i> (2000)
Indiana Limestone (USA)	50.6	Katz <i>et al.</i> (2000)
Dolomite (Greece)	40–60	Sachpazis (1990)
Devonian (Napier Range, Australia)	55.9–56.6	Goudie <i>et al.</i> (1989)
Carboniferous (Buxton, UK)	51.0	Goudie <i>et al.</i> (1989)
Magnesian (UK)	35.0	Goudie <i>et al.</i> (1989)
Ancaster Freestone (UK)	30.0	Goudie <i>et al.</i> (1989)
Jurassic Bath Stone (UK)	15.0	Goudie <i>et al.</i> (1989)
Upper Cretaceous (Portugal)	38.0	Andrade <i>et al.</i> (2002)
Lower Cretaceous (Portugal)	39.0	Andrade <i>et al.</i> (2002)
<b>Miscellaneous sedimentary</b>		
Marls (Turkey)	17.5–44.6	Gökçeoğlu and Aksoy (2000)
Shale (Istanbul, Turkey)	30–64	Goktan and Gunes (2005)
Neogene mudstones (Japan)	10.5–32	Hayakawa and Matsukura (2003)
Mudstone (Ankara, Turkey)	27.1–38.6	Gökçeoğlu and Aksoy (2000)
Mudstone (Kaikoura, New Zealand)	32–35	Stephenson and Kirk (2000)
Pliocene and Miocene marls (Turkey)	<20–51	Basarir and Karpuz (2004)
Sandstone (Ankara, Turkey)	18.3–33.6	Gökçeoğlu and Aksoy (2000)
Sandstone (Handere, Turkey)	44.50	Yaşar and Erdoğan (2004)
Torridonian sandstone (Scotland)	43	Ballantyne <i>et al.</i> (1997)
Devea sandstone (Ohio, USA)	50.8	Katz <i>et al.</i> (2000)
Clarens sandstone (South Africa)	55	Sumner and Nel (2002)
Elliott sandstone (South Africa)	54	Sumner and Nel (2002)
Cambrian/Ordovician sandstones (SE Jordan)	41.0–44.7	Goudie <i>et al.</i> (2002)
Eocene Matjilla sandstone (California)	42.1	Duvall <i>et al.</i> (2004)
Eocene Sacate sandstone shale (California)	55	Duvall <i>et al.</i> (2004)
Gaviota (sandstone/shale) (California)	34.2	Duvall <i>et al.</i> (2004)
Vaqueros Oligocene sandstone (California)	22.7	Duvall <i>et al.</i> (2004)
Ashover Grit (Derbyshire, UK)	42.4	Williams and Robinson (1983)
Jurassic fine to medium grained sandstone (Alaska)	59	Whipple <i>et al.</i> (2000)
Jurassic siltstone/sandstone (Alaska)	46	Whipple <i>et al.</i> (2000)
Greywacke (Wellington, New Zealand)	24.0	Kennedy and Beban (2005)
Dolomite (Turkey)	55–59	Kahraman <i>et al.</i> (2004)
Silcrete (Botswana)	62.07	Day and Goudie (1977)
Sarsen Stones (England)	54.9	Day and Goudie (1977)
Upper Cretaceous marl (Portugal)	25	Andrade <i>et al.</i> (2002)
Carboniferous shale (Portugal)	27	Andrade <i>et al.</i> (2002)

(continued)

**Table 1** Continued

Material	Mean R value	Source
<b>Metamorphic</b>		
Marble (Barbaros, Turkey)	54.80	Yaşar and Erdoğan (2004)
Marble (Osmaniye, Turkey)	47.42	Yaşar and Erdoğan (2004)
Marble (Carrara, Italy)	58.6	Katz <i>et al.</i> (2000)
Marble (Turkey)	48.3–58.0	Kahraman <i>et al.</i> (2002)
Marbles (Greece)	35–47	Sachpazis (1990)
Magaliesberg quartzite (South Africa)	62	Sumner and Nel (2002)
Precambrian quartzite (Botswana)	67.1	Day and Goudie (1977)
Migmatite (Kora, Kenya)	47.3–50.6	Pye <i>et al.</i> (1986)
Gneiss (Kora, Kenya)	49.4–53.5	Pye <i>et al.</i> (1986)
Quartz-Schist (NW Scotland)	48.2	Brook <i>et al.</i> (2004)
Gneiss/arenite/quartzite (NW Scotland)	45.7	Brook <i>et al.</i> (2004)
Gneiss (Yukon, Canada)	24–42	Brideau <i>et al.</i> (2004)
Biotite schist (S Alps, New Zealand)	51.5	Augustinus (1992b)
Greywacke/argillite (S Alps, New Zealand)	64.5	Augustinus (1992b)
Grey/Green schist (S Alps, New Zealand)	49.5	Augustinus (1992b)
Schist (Turkey)	40.0–43.7	Gökçeoğlu and Aksoy (2000)
<b>Igneous</b>		
Granite (Sierra Nevada, USA)	48–53	Ericson (2004)
Mt Scott granite (Oklahoma)	73.4	Katz <i>et al.</i> (2000)
Granite (Sweden)	55–56	Ericson (2004)
Cairngorms granite (Scotland)	66.5	Brook <i>et al.</i> (2004)
Granite (Shap, UK)	59.4–61.1	Day and Goudie (1977)
Salem granite (Namibia, Spitzkoppje)	59.4	This paper
Granite (Turkey)	55.7–62.5	Kahraman <i>et al.</i> (2002)
Roach Island tuff (Lord Howe Island)	23.4–31.8	Dickson <i>et al.</i> (2004)
Basalt (Turkey)	61.8–66.0	Kahraman <i>et al.</i> (2002)
North Ridge basalt (Lord Howe Island)	44.2–48.3	Dickson <i>et al.</i> (2004)
Vestfiröir Peninsula basalt (Iceland)	67.3	Brook <i>et al.</i> (2004)
Basalt (N. Greece)	42.4	Aggitalis <i>et al.</i> (1996)
Marion Island basalt (Antarctic)	64	Sumner and Nel (2002)
Drakensberg basalt (South Africa)	62	Sumner and Nel (2002)
Toprakkale basalt (Turkey)	52.40	Yaşar and Erdoğan (2004)
Mount Lidgbird basalt (Lord Howe Island)	53.2–62.3	Dickson <i>et al.</i> (2004)
Ankara andesite (Turkey)	54–61	Karpuz and Paşamehmetoğlu (1997)
Gevanim syenite (Israel)	65.0	Katz <i>et al.</i> (2000)
Karoo dolerite (South Africa)	64	Sumner and Nel (2002)
Gabbro (N. Greece)	32.2	Aggitalis <i>et al.</i> (1996)
Gabbro/dolerite (Kora, Kenya)	47.7	Pye <i>et al.</i> (1986)
Cuillins gabbro/peridotite/granophyre (Scotland)	67.9	Brook <i>et al.</i> (2004)
Diorite/Gabbro (S Alps, New Zealand)	61.1	Augustinus (1992b)
Granodiorite (Turkey)	57.0–63.3	Kahraman <i>et al.</i> (2002)
Dacite (Turkey)	43.75	Karakus <i>et al.</i> (2005)
Epidote-amphibolite (Turkey)	50.79	Karakus <i>et al.</i> (2005)
Diabase (Turkey)	62	Kahraman (2001)
Serpentine (Turkey)	59–62	Kahraman (2001)