

MINERALS AND MINERALOIDS IN MARINE SEDIMENTS

An Optical Identification Guide

R. G. ROTHWELL

*Institute of Oceanographic Sciences,
Wormley, Godalming, UK*



ELSEVIER APPLIED SCIENCE
LONDON and NEW YORK

CONTENTS

<i>Foreword</i>	v
<i>Preface</i>	ix
<i>Acknowledgements</i>	xi
PART I	1
The mineralogy of marine sediments	3
The composition of marine sediments	3
Sediment classification	6
Distribution of sediment types	15
The abundance of minerals in marine sediments	19
The smear slide method	21
PART II	25
Minerals and Mineraloids Occurring in Marine Sediments	27
Explanatory Notes	27
Aragonite	36
Barite	42
Calcite	47
Clay	57
Dolomite	60
Feldspar	65
Ferromagnesian minerals	79
Amphiboles	79
Olivine	86
Pyroxenes	89
Glauconite	95
Gypsum (and anhydrite)	103
Heavy minerals	109
Andalusite	111
Apatite	113
Cassiterite	115
Epidote	117
Garnet	119
Kyanite	122
Monazite	124
Rutile	125
Sillimanite	127

CONTENTS

Sphene (titanite)	128
Staurolite	130
Tourmaline	132
Zircon	135
Iron Oxides	139
Haematite	139
Ilmenite	140
Limonite	141
Magnetite	142
Mica	144
Micronodules (Fe–Mn oxides and hydroxides)	151
Palagonite	156
Pyrite	161
Quartz	167
Volcanic glass	175
Zeolites	186
Clinoptilolite	186
Phillipsite	191
Native elements	200
Extraterrestrial material in marine sediments	202
<i>References</i>	211

APPENDICES

225

APPENDIX 1: Glossary of descriptive terms used in the text	227
APPENDIX 2: Comparative percentage charts for estimating proportions of sedimentary components	233
APPENDIX 3: Suggested format for a smear slide descriptor form	236
APPENDIX 4: Flow charts for the identification of mineral grains seen in smear slides	239
APPENDIX 5: An illustrated key to the identification of the main microfossil groups	246
<i>Index</i>	273