

Iron Oxide Rock Artefacts in Mesopotamia c. 2600-1200 BC

An interdisciplinary study of hematite, goethite
and magnetite objects

Martine Marieke Melein



ARCHAEOPRESS PUBLISHING LTD
Summertown Pavilion
18-24 Middle Way
Summertown
Oxford OX2 7LG

www.archaeopress.com

ISBN 978 1 78491 964 1
ISBN 978 1 78491 965 8 (e-Pdf)

© Archaeopress and Martine Marieke Melein 2018

Cover illustration: Stamp seal and cylinder seals from the De Liagre Böhl Collection, Leiden.

All rights reserved. No part of this book may be reproduced, or transmitted, in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of the copyright owners.

Printed in England by Oxuniprint, Oxford

This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

List of Figures.....	iii
List of tables.....	iv
Acknowledgements.....	v
1. General introduction.....	1
1.1 Background.....	1
Text-based approach.....	2
1.2 Aim and outline of the research.....	3
1.3 Dissemination of the results.....	4
2. Formation, mineralogy and occurrence of iron oxide rocks.....	5
2.1 Introduction.....	5
2.2 Mineral properties of iron oxide rocks and recognizing iron oxide rocks in the field.....	5
2.3 Formation of iron oxide rocks.....	12
2.4 The occurrence of iron oxide rocks in and around Mesopotamia.....	15
2.5 Summary and conclusions.....	19
3. The archaeological evidence – a qualitative approach.....	20
3.1 Introduction.....	20
3.2 Raw iron oxide rocks in excavations.....	21
3.3 Type of objects made out of iron oxide rocks.....	24
3.3.1 Seals.....	24
3.3.2 Balance weights.....	30
3.3.3 Miscellaneous iron oxide rock artefacts.....	35
3.3.4 Summary of the artefact types.....	40
3.4 Production of artefacts.....	41
3.4.1 Summary of the production process.....	46
3.5 Summary and conclusions.....	46
4. The archaeological evidence – a quantitative approach.....	48
4.1 Introduction.....	48
4.2 Lay-out of the database.....	48
4.2.1 Labels.....	48
4.2.2 Regions.....	50
4.2.3 Date in years vs. periods.....	52
4.3 Assessment of the database.....	58
4.3.1 Artefacts left out of the analyses.....	60
4.4 Artefacts per period.....	60
4.5 Artefacts per period per context.....	69
4.6 Artefacts per period per region.....	70
4.7 Sizes of the artefacts and the half fabricates.....	72
4.7.1 Sizes of the artefacts.....	72
4.7.2 Sizes of the half- fabricates.....	72
5. Hematite – the evidence from the cuneiform sources.....	76
5.1 Introduction.....	76
5.2 Identification of the terms.....	76
5.2.1 ^{NA} 4KA.GI.NA, ^{NA} 4KUR-nu and <i>šadānu</i>	76
5.2.2 Writing.....	78
5.2.3 <i>Ḥusarum</i> not hematite.....	78
5.2.4 The illness <i>šadānu</i>	78
5.3 The textual sources.....	79
5.3.1 Texts mentioning <i>šadānu</i> – not medical-magical.....	79
5.3.2 <i>ḤAR-ra=ḥubullu</i> : a Mesopotamian introduction to <i>šadānu</i>	80

5.3.3	Ninurta/Lugal-e	81
5.3.4	Astrological text	81
5.3.5	Objects made of <i>šadānu</i>	82
5.3.6	The provenance of <i>šadānu</i> according to the texts.....	82
5.3.7	<i>Šadānu šābitu</i> and the earliest description of magnetism	83
5.3.8	Magical-medical texts.....	83
6.	Material Analyses.....	86
6.1	Introduction	86
6.2	Aims	86
6.3	Previous research	86
6.4	Analysis of artefacts from three Dutch collections.....	87
6.4.1	Introduction	87
6.4.2	Materials and Methods	89
6.4.3	Results	94
6.4.4	Archaeological discussion.....	105
6.4.5	Discussion of the techniques applied for this research	106
6.5	Summary and conclusions	106
7.	Conclusions and synthesis	108
7.1	Research questions and approach	108
7.2	Conclusions.....	108
7.2.1	Mineralogy and geology	108
7.2.2	Archaeology – a qualitative approach	109
7.2.3	Archaeology – a quantitative approach.....	109
7.2.4	Cuneiform sources.....	109
7.2.5	Archaeometry - Material analyses.....	110
7.3	Synthesis	110
7.4	Future research.....	112
	Summary	123
	Appendix I: Overview of Syrian and Mesopotamian history, and cylinder seal styles ca. 3000-1200 BC	128
	Appendix II: The Database	130
	Appendix III: Reference numbers used in the database.....	200
	Appendix IV: Concordance of artefacts from the De Liagre Böhl Collection.....	202
	Appendix V: Medical-magical texts mentioning iron oxide rock	203
	Appendix VI: Material analyses per artefact.....	208