

Rubric Memo



UNIVERSITY
OF
JOHANNESBURG

PROGRAM : BACHELOR OF ENGINEERING TECHNOLOGY
EXTRACTION METALLURGY

SUBJECT : ENGINEERING GEOLOGY (METALLURGY) 2B
PRACTICAL TEST 2_MODULE 2

CODE : GMESCB2

DATE : 15 October 2021

SESSION : 1

VENUE : JOB1201

DURATION : 09:40 – 15:25

TOTAL MARKS : 34

EXAMINERS : MS S F MKHATSHWA

MODERATOR : MR F E D SENZANI

NUMBER OF PAGES : 3 PAGES

STUDENT NUMBER	
STUDENT INITIALS	
STUDENT SURNAME	
STUDENT SERIAL NUMBER (SEE REGISTER)	

INSTRUCTIONS

- ALL WORK SHALL BE HANDED IN.
- ALL UJ EXAMINATION REGULATIONS APPLY.
- OPEN BOOK TEST.
- OBSERVE ALL PROPERTIES OF 2 OXIDE MINERALS WITHIN THE POLISHED RESIN MOUNT, PROVIDE THEIR PERCENTAGES AND PROVIDE THEIR NAMES USING ALL YOU HAVE IDENTIFIED AND COMPLETED
- SUBMIT THE WHOLE DOCUMENT

COMPARE THE OXIDE MINERALS, HOW THEY DIFFER WITH PLANE POLARIZED LIGHT AND CROSSED NICOLS. EXPLAIN WHAT YOU SEE. DETERMINE THE TOTAL MAGNIFICATION, STATE THE OBJECTIVE USED AND THE AVERAGE SIZE OF EACH OXIDE.

OPTICAL PROPERTIES	MINERAL NAME: Haematite	MINERAL NAME: Magnetite
	% IN POLISHED BLOCK [s.c.]	% IN POLISHED BLOCK [s.c.]
PPL/XPL		
COLOUR	White	Grey, brownish
BIREFRACTANCE	Weak, white to grey-white	Absent
INTERNAL REFLECTION	Deep red common	not present
REFLECTIVITY	Moderate	Low
POLISHING AND SCRATCH	S.H. - +	S.H. - +
HARDNESS	P.S. < Pyrite > Magnetite	PH < Pyrite > Pyrrhotite
EXOLUTION/ALTERATION AND SHAPE	Ilmenite, magnetite Euhedral, tabular	Ilmenite, haematite Euhedral to anhedral
PPL/XPL		
ANISOTROPISM	grey tint / blue-green to yellow	Isotropic
MAGNIFICATION, OBJECTIVE, MINERAL SIZE, LIBERATION AND TEXTURE		
TOTAL MAGNIFICATION		
OBJECTIVE		
MINERAL SIZE		
LIBERATION AND TEXTURE		

Haematite

For 50x ≥ 200 micrometers

$10 \times 20 = 200$ micrometers

(greater than fov)

percentage : 95%

1 - 10

20 microns $\rightarrow$ > 200 micrometers

Haematite : Intergranular
Planar
Reticulate

Magnetite : Planar
Reticulate

CALCULATIONS/NOTES

Magnetite

grain size ≥ 200 micrometers $150 \rightarrow \geq 200$
percentage : 95% $\leftarrow$ close to 95
(80-95)

15

Beach sand changes to
chromite mix

MIRANIDA POLISHED SECTIONS

	Polished section number	Sphalerite	Chalcopyrite	Pyrite	Pyrrhotite	Other or Gangue
	4					
X	4/1	20	40	20	20	
	4/2	30	30	0	30	Galena 10
	4/3	50	0	50	0	
	4/4	40	40	0	20	
X	4/5	40	40	20	20	
	4/6	35	35	0	30	
X	4/7	25	25	25	25	
X	4/8	40	40	10	10	
	4/9	40	38	0	20	Galena 2
X	4/10	20	30	20	20	Magnetite 10
	4/11	35	35	30	0	
	4/12	40	30	0	15	15
X	4/13	40	10	40	0	Magnetite 10
	4/14	40	30	0	20	Galena 10
X	4/15	30	30	20	20	
	4/16	40	30	10	10	Magnetite 5
	4/17	40	20	25	10	Magnetite 5

Sphalerite: 20-40%
40%

Chalcopyrite: 20-45 microns
≥ 20%

Pyrite: 0-5%
size: 60-100 microns

Pyrrhotite

Galena: 25-120
↓
20-30%

50 magnification
400.2 - 0.025 x 2
= 10.5

Pyrrhotite: percentage 0-10%
size 20-35 microns

Pyrite: percentage 0-5%
size 60-100 microns

Chalcopyrite: percentage ≥ 20%
size 20-45

Sphalerite: percentage 40%
size ≥ 60 microns

Galena: percentage 20-35%
size 65-100 microns