# ROGALAND COMPLEX, NORWAY

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#### LOCATION



 Samples are found in Southern Norway

(freeworldmaps.net)

## ROGALAND IGNEOUS PROVINCE

Consists of:

- 3 large massif-type anorthositic bodies
  - Egersund, Haland-Helleren, and Ana-Sira
- Layered Intrusion
  - Bjerkreim-Sokndal



- 2 Smaller bodies of leuconorite
  - Hidra and Garsaknatt

- Overall age: 1.25 0.9 Ga
- Depth: Roughly 20 km.



(Duchesne, 2001)

#### BJERKREIM-SOKNDAL INTRUSION

Broken down into 6 • megacyclic units (MCU)

- MCU 0
- MCU la
- MCU lb
- MCU II
- MCU III
- MCU IV

• The 6 megacyclic units are individually subdivided into zones (a-f)



(sciencedirect.com)

- The layered intrusion precipitated from jotunitic magmas
  - Forming dominant minerals of plagioclase, orthopyroxene, and ferriilmenite
    - Which lead to producing hemo-ilmenite during cooling
- Fractional crystallization then started when more primitive magma started to influx and mix in
  - Producing the 6 megacyclic units
    - The minerals then turned into plagioclase-rich norites, hemoilmenite-rich norites, and magnetite norites
- After the last major influx took place near the base of MCU IV
  - Fractional crystallization continued until the norites turned into extremely fractionated, more massive, fayalite-bearing mangerites and quartz mangerites in the upper part of the intrusion.

### **GUIDING QUESTIONS**

- What are the compositions of my samples and do they match previous analyses?
- How dense are my samples?

#### METHODS

- Create thin-sections
- Make optical mineralogy observations/approximations
- Compare and contrast
- Calculate mass and volume to find density

## SAMPLES

- Quartz Mangerite (QMG) plagioclase, Ca-poor pyroxene, Ca-rich pyroxene, fayalite, ilmenite, magnetite, apatite, mesoperthite, quartz
- Mangerite (MG) plagioclase, Ca-poor pyroxene, Ca-rich pyroxene, fayalite, ilmenite, magnetite, apatite, mesoperthite
  - Orthopyroxene-bearing monzonite

## QUARTZ MANGERITE

PPL





 $\mathsf{XP}$ 

### QUARTZ MANGERITE ESTIMATES



- Albite = 40%
- Anorthite = 11%
- Orthopyroxene = 15%
- Quartz = 10%
- Clinopyroxene = 10%
- Apatite = 7%
- Magnetite = 7%

## MANGERITE

PPL





XP

## MANGERITE ESTIMATES



- Albite = 42%
- Orthopyroxene = 16%
- Clinopyroxene = 13%
- Anorthite = 10%
- Magnetite = 8%
- Quartz = 7%
- Apatite = 4%

### NORMATIVE COMPOSITIONS

	Mangerite		Quartz Ma
DR	24.5		28.1
AB	40.9		35
AN	8.8		4.3
Q	4.7		10
СРХ	6.8		6.3
ΟΡΧ	8.6		9.8
MT	2.6		2.5
ILM	2.3		2.8
AP	0.8		1.3

#### **DENSITY & SPECIFIC GRAVITY**

Specific Grafity = 
$$\frac{Wa}{Wa - Ww}$$

- Weight in air obtained from balance
- Rock was submerged in water for the weight



#### CHILLED MARGIN (MCU 0)

Specific Gravity

- Weight in air = 24.18 grams
- Weight in water = 16.29 grams
- Specific Gravity = 3.064638783

#### TROCTOLITE (MCU IVB)

#### Specific Gravity

- Weight in air = 33.61 grams
- Weight in water = 21.81 grams
- Specific Gravity = 2.848305085

General specific gravity - 2.86-2.87

#### QUARTZ MANGERITE

#### Specific Gravity

- Weight in air = 37.39 grams
- Weight in water = 24.18 grams
- Specific Gravity = 2.830431491

### MANGERITE

Specific Gravity

- Weight in air = 40.32 grams
- Weight in water = 27.06 grams
- Specific Gravity = 3.040723982

General specific gravity - 2.8-3



### REFERENCES

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