Igneous differentiation 100 years after Bowen - has anything changed?



Jon Blundy (University of Bristol)





N.L. Bowen (1887-1956)



What's changed? Technology?









100µm UoB-ES 18/10/2012 10.0kV BSE WD 11.0mm 16:17:22

What's changed? Concepts?



Crystallisation



Partial melting

"the settling out from basic magma of certain minerals is the dominant control in the differentiation of most igneous rocks." (N.L. Bowen, 1914)



Reactive mushes







Uturuncu, Bolivia

Peru



Porphyry Copper Deposits





Magmatic brines





Laser-ablation ICP-MS



In situ measurements









"Holistic Mushmatology"

- Integrated petrology, geophysics (seismology, gravity, MT), geochronology and geodesy
- Physics of rock rheology and time-dependent deformation
- •Coupled physical/chemical models of reactive transport
- More interaction with mining and oil/gas industry
- Magmatic brine the new magma
- In situ experimental studies
- •3D textures tomography
- International analytical facilities (synchrotron, ion-probe etc)
- •Integrated data storage and access (including rocks)



Thank you for your attention