

WORKSHOP 2

CATHODOLUMINESCENCE IN SEDIMENTARY PETROLOGY

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INTRODUCTION

Cathodoluminescence (CL) is widely used in sedimentary petrology, especially in the study of carbonate rocks. The factors governing CL intensity and spectral emission are now becoming known and CL is gaining acceptance as an important qualitative analytical tool.

This workshop will examine the application of CL to sedimentary petrography. A lecture session will discuss and evaluate CL in carbonates and in siliciclastics. Issues such as instrumentation, cement stratigraphy, discrimination of altered vs. unaltered skeletal material, sandstone framework mineralogy, porosity occlusion and pressure solution, and diagenesis will be discussed. Projection facilities will permit real-time examination of samples during discussion. A laboratory session will permit participants to gain experience with CL equipment and effects of operating conditions.

OUTLINE

Nature of CL in crystalline materials

Variability in CL

Intensity

Wavelength

Quenchers

Controls on CL

Chemical

Major elements

Trace elements

Physical (strain)

CL in rock-forming minerals

Silicates

Quartz

Feldspars

Fe-Mg minerals

Accessory minerals

Carbonates

Calcite

Dolomite
Aragonite
Phosphates and others
Apatite

Cements

Diagenesis

Albitization
Carbonates
Pressure solution in sandstones

Instrumentation

Luminescences chambers
SEM-type sources
Microscopes
Spectrometers

Laboratory

Practical experience in operating a Nucleide ELB-2B w/spectrophotometer
Examination of participants samples