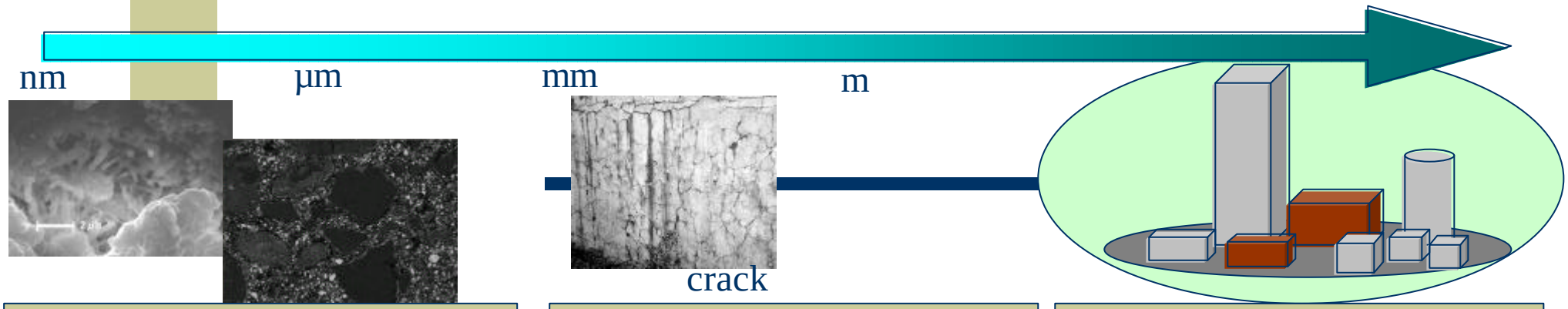
Develop the prediction models for structural performance during service life through construction material deterioration models from viewpoint of microstructure

Hokkaido University

Kiyofumi Kurumisawa

21st Century
HOKKAIDO University
Socio-Environmental Engineering Group

Prediction models for structural performance during service life



Formation

Physical behavior

Deterioration

Hydration

Microstructure

Transport phenomena

Stress

Crack

Shrinkage,Creep

Carbonation, Chloride ingress

Corrosion of steel

Change of properties

Use of recycled materials

Development of repair technique

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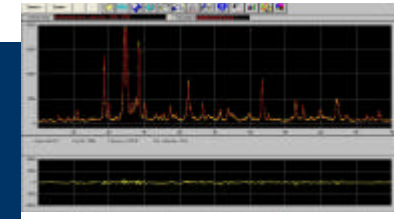


Microstructure (Rietveld analysis, BEI etc)

Deterioration mechanism

(Chloride penetration, Autogeneous shrinkage etc)

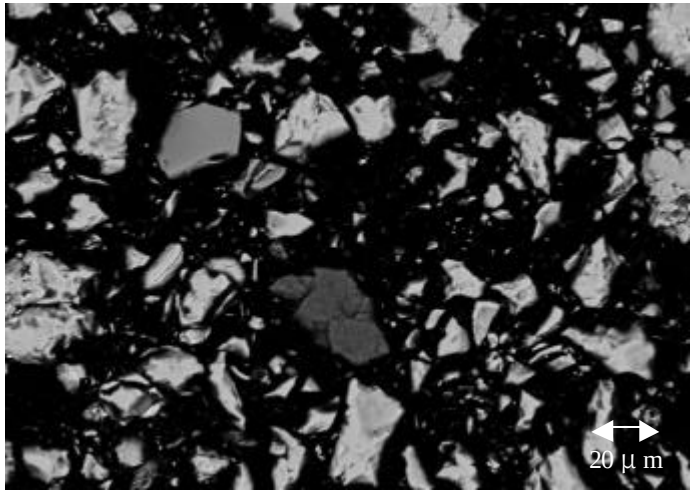
Utilization of Recycled aggregate(Closed system)

Utilization of waste materials for concrete

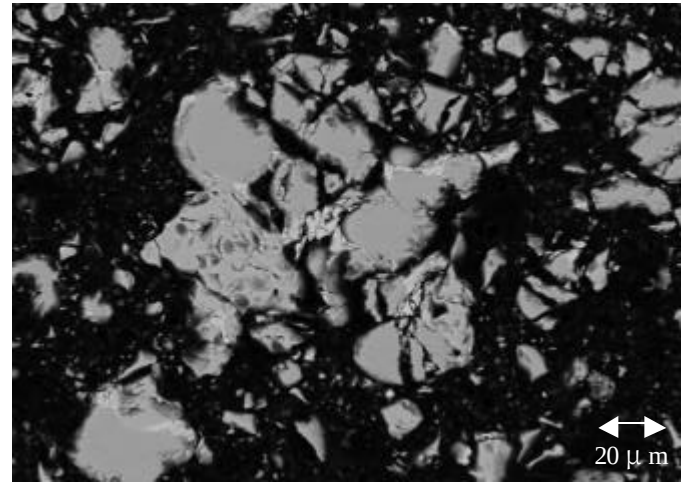
(Fly ash, BFS, recycled powder etc)

BEI of cement particle

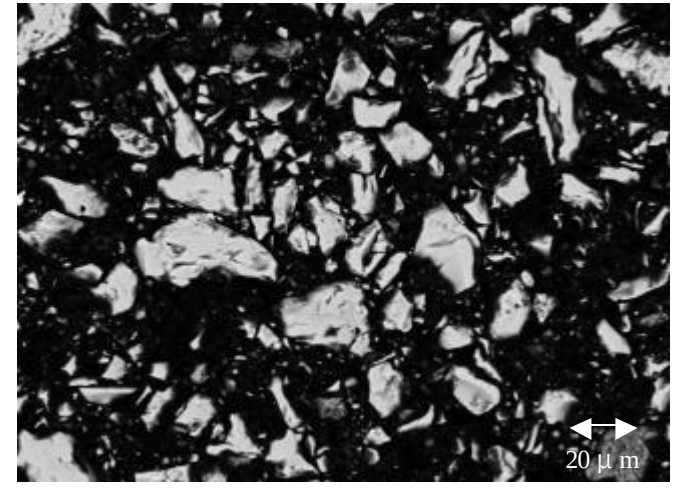
OPC



LHC



RHC



Ferrite > Alite > Belite > Aluminate > Gypsum > Periclase > Epoxy resin