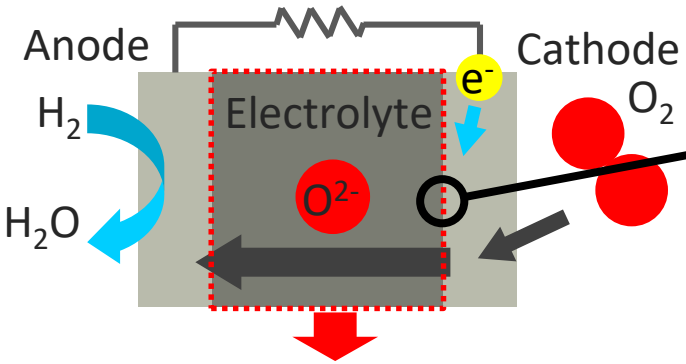
Let's synthesize ceramic electrolytes for fuel cells!

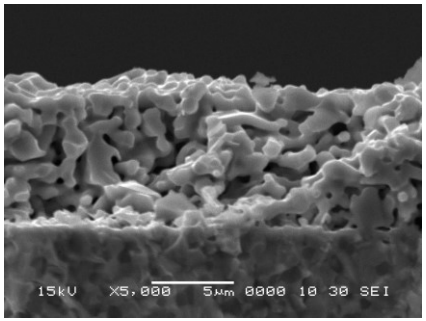
Department of Materials Science and Engineering
Staffs: Prof. Hitoshi Takamura
○Assist. Prof. Itaru Oikawa（TEL: 022-795-3939, Email: itaru@material.tohoku.ac.jp）
Assist. Prof. Akihiro Ishii

Abstract:
Solid oxide fuel cells (SOFCs) can generate electricity with high efficiency owing to high temperature operation (～750℃), and are expected for wider applications including large-scale power generation, household use and transportation applications. SOFCs generate electricity from H_2 and O_2. These gases are separated by a ceramic electrolyte to prevent direct oxidation of H_2. Therefore, not only high O^{2-} conductivity but also dense body with no permeability of gaseous phases are necessary at operating conditions. This course provides opportunity to learn about synthesis process of dense ceramic electrolytes for SOFCs. Let's synthesize denser ceramics with high ionic conductivity!

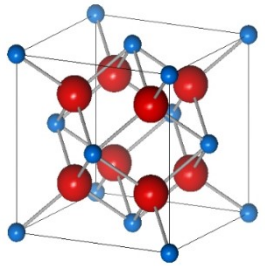
Ceramic Electrolytes for SOFC



High O^{2-} conductivity and no permeability of gaseous phases



Y_2O_3 stabilized ZrO_2



Let's synthesize denser ceramics with high ionic conductivity!