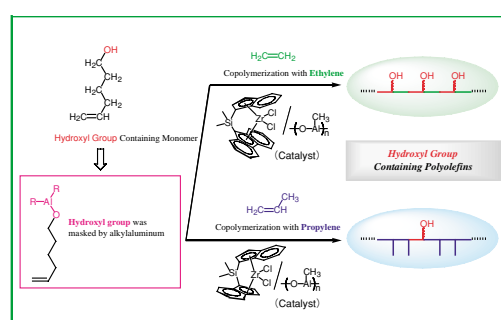


Functionalization of Polyolefins: Synthesis of Polyolefins Containing Hydroxyl Group

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Recently, the introduction of polar group into polyolefins has attracted much attention. However, the copolymerization of olefin and polar monomer has not proceeded because an interaction between the polar group and catalyst inhibits the polymerization. We employed an olefin containing a hydroxyl group as a comonomer (such as 5-hexen-1-ol), which was masked by alkylaluminum before polymerization, and developed a copolymerization system with olefins (ethylene and propylene) by a zirconium catalyst. It was found that the bulky aluminum compound was effective as a masking reagent and microstructure of copolymer

could be controlled by the catalyst structure. The copolymers containing a hydroxyl group exhibited the hydrophilic property.



Synthesis of hydroxyl group containing polyolefins

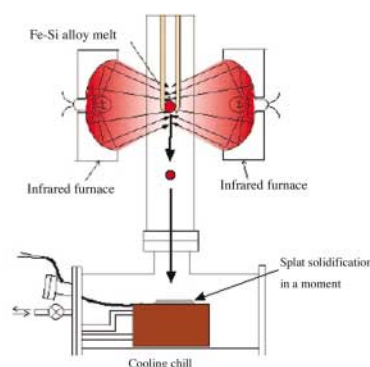
New Synthesis Process of Next Generation Semiconductor

- Synthesis of β -FeSi₂ by Use of Microgravity Environment -

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β -FeSi₂ is one of the promising materials for the light-emitting devices, solar cells and thermoelectric devices. However, it is difficult to synthesize it from the melt because of the complicated Fe-Si phase system. In a microgravity environment, we can keep a homogeneous melt because of no thermal convection and no segregation. We could synthesize the homogeneous material at a nanometer-level by splat solidification of this homogeneous melt and obtain a β -FeSi₂ single phase by heating to 850°C. We will synthesize β -FeSi₂ doped impurity homogeneously and β -

FeSi₂ single crystal from the nanometer-level dispersed Si and Fe formed in microgravity.



Schematic diagram of splat solidification apparatus of Fe-Si alloy