Bioelectrochemical hydrogen and ethanol production from Glycerol as a by-product from Biodiesel production

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Recently, biodiesel fuel (BDF) is paid an attention as an alternative fuel throughout the world. Glycerol is produced as a by-product from the BDF production. Glycerol is sold as a chemical substrate. However, if BDF production substantially increases, other treatments of glycerol are needed.

Enterobacter aerogenes is a representative hydrogen-producing bacterium, and converts glycerol into hydrogen gas and ethanol. Both hydrogen and ethanol yields are more than 80% even in the wild type of *E. aerogenes*.

We now forward a project on hydrogen and ethanol production from glycerol as a by-product, supported by NEDO Industrial Technology Research Grant Program. Both hydrogen and ethanol yields reached to more than 90% from pure glycerol. From this year, we are trying to treat waste glycerol discharged from the BDF production using waste vegetable oil.

Glycerol consumption suppressed at more than 80 mM of glycerol concentration in glycerol-containing wastes from biodiesel production. We previously reported that hydrogen production rate per cell increased under bioelectrochemical conditions. We have also investigated bioelectrochemical hydrogen and ethanol production from glycerol-containing wastes.