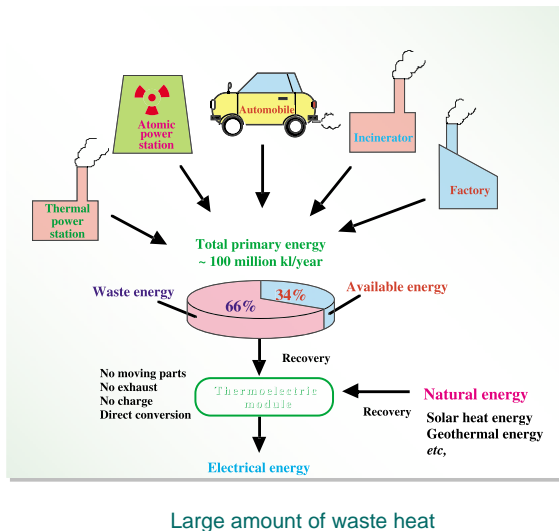


A Thermoelectric Oxide for High Temperature Application

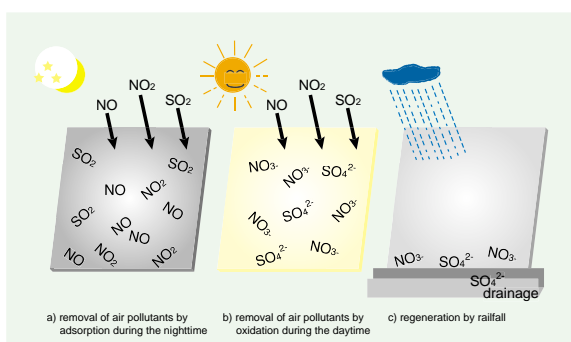
An oxide single crystalline whisker with high thermoelectric properties at high temperature in air has been discovered. The composition of the whisker is $(\text{Ca, Sr, Bi})_2\text{Co}_2\text{O}_5$ (abbreviated to Co-225 whisker). Seebeck coefficient S and electrical resistivity ρ of the whisker are $200\text{-}210 \mu\text{V/K}$ and $1.4\text{-}1.5 \text{ m}\Omega\text{-cm}$ at temperatures higher than $600 \text{ }^\circ\text{C}$, respectively. Using thermal conductivity κ of a Co-225 polycrystalline sample, figure of merit $ZT (= S^2T/\rho\kappa, T$; absolute temperature) of the Co-225 whisker is estimated over 1.2 at temperatures higher than $600 \text{ }^\circ\text{C}$. The discovery of the oxide with high thermoelectric performance at high temperature in air leads to the expectation that electric power generation using waste heat from automobiles, factories, and similar sources will be realized in the near future.



Ryoji FUNAHASHI
Special Division of
Green Life Technology
e-mail:
funahashi-r@aist.go.jp
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Development of Visible-Light-Responsive Titanium Oxide Photocatalyst for Environmental Purification

Photocatalysis is a promising method for energy-saving environmental purification. We have found that oxygen-deficient titanium dioxide samples prepared by radio-frequency plasma treatment have photocatalytic activity not only under illumination of ultraviolet light but also with visible light (400-600 nm). The new photocatalyst, which will soon be supplied by a collaborating company, is expected to work more efficiently under the sun as well as in the indoor environment.



Koji TAKEUCHI
Institute for
Environmental
Management Technology
e-mail:
takeuchi-koji@aist.go.jp
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Air-purifying material - typical environmental application of photocatalysis