

## Technology Development Headquarters

“Research and Development to create the value for next generation”

At Technology Development Headquarters, we are promoting research and development, performing our duty, to provide social value continuously through manufacturing, considering that the field of environment in a broad sense is the important item.

In addition, we are challenging the creativity, which is the core of our technologies, promoting high level research and devel-

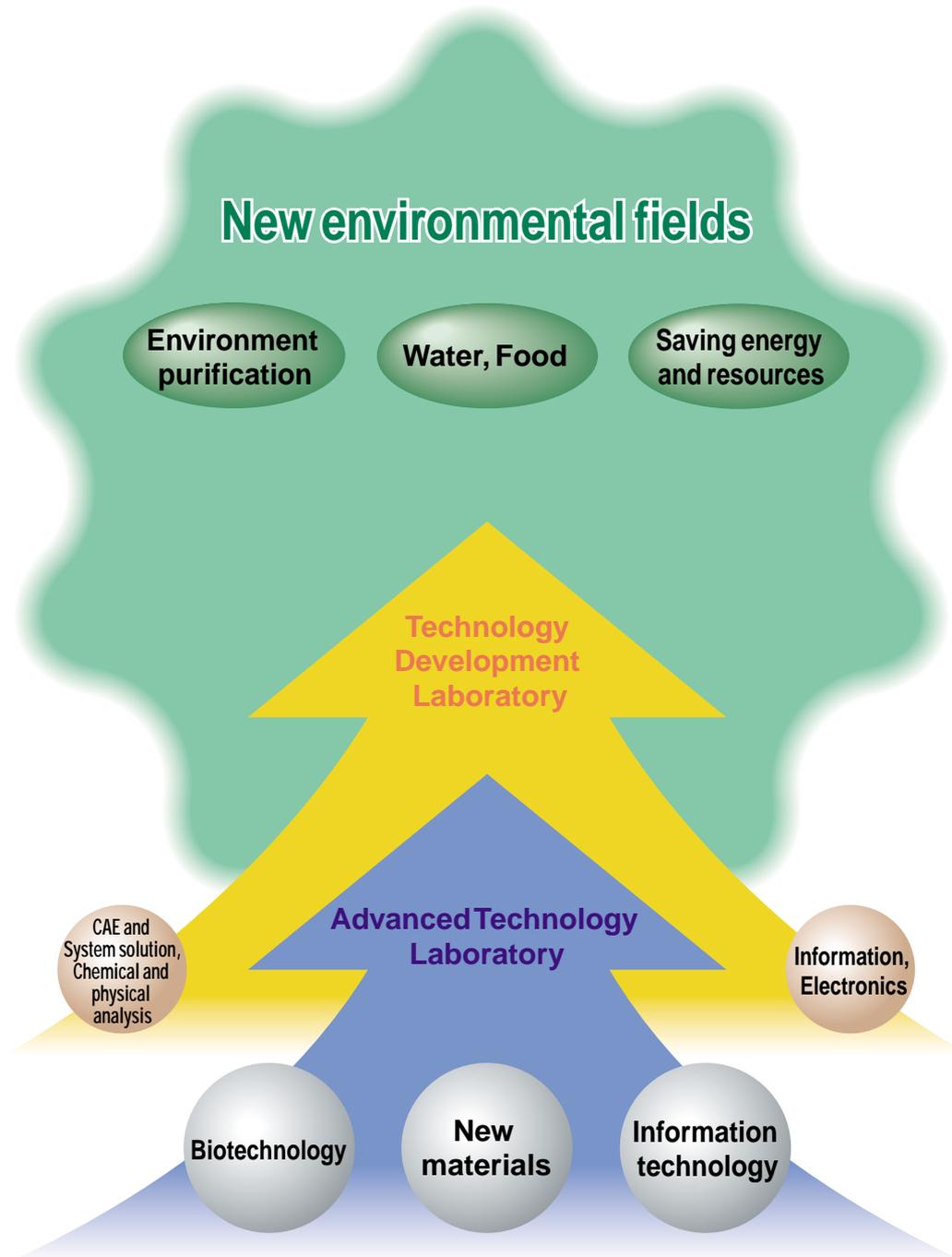
Managing Director and  
General Manager of  
Technology Development  
Headquarters

**Yoshihiro Kinugasa**



opment such as basic technologies including biotechnology, new materials and information technology, and new products and systems which are exceeding the frame of each division.

We are also promoting the anticipative research and development, considering the global problems in 21<sup>st</sup> century.



## Ah-Immunoassay™ for toxic detection of dioxins

Gas chromatography and mass analysis are approved as public authorized method for measurement of dioxins.

Recently the simplified analytical method is required, which evaluates the toxicity easily and rapidly.

Ah-Immunoassay™ method is new bio-assay method kit which can detect the toxicity of dioxins totally, applying the toxic expression mechanism of dioxins.

Ah-Immunoassay™ can analyze the 6 to 20 samples simultaneously.

Only cheap equipment such as absorption spectrophotometer is required for analysis.

Rapid analysis, approximately 6 hours, is possible.

Ah-Immunoassay™ is exclusively licensed to Kubota Corp. from Paracelsian Inc., U.S.A.



Ah-Immunoassay™ kit

## CFC-free heat pump system complying with multiple fuels

Aiming at energy conservation and CFC-free thermal utilization, we have been developing a gas engine-driven heat pump system composed of an injection type gas engine complying with hydrocarbon and hydrogen system gases and a CFC-free heat pump using helium as a working gas.

The system can utilize efficiently various kinds of gaseous fuels such as town gas and propane gas widely used as fuel, methanol reformed gas, and hydrogen gas expected as future clean fuel. And this system produces four thermal outputs for air-conditioning, hot water supply, and refrigeration ( $-10^{\circ}\text{C}$ ), all in a single system. High COP (coefficient of performance) is confirmed as a CFC-free heat pump. The heat pump system is aiming at 20% or more energy saving, comparing with the conventional systems.

## The development of microporous materials

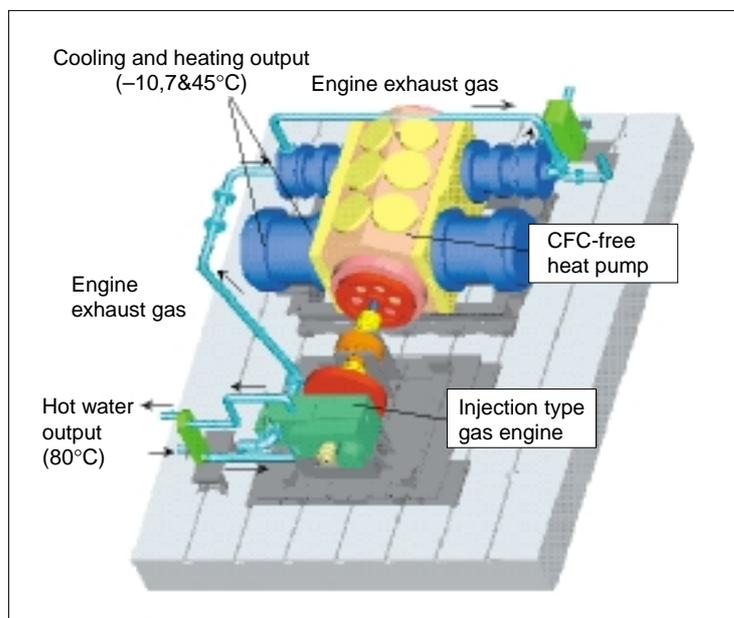
The development of high efficiency catalyst is required from the viewpoint of saving energy and reduction of wastes.

In this atmosphere, we have developed a microporous material applicable to environmental catalyst and chemical synthetic catalyst, applying our original technology, namely solid-state synthesis method.

We are now developing the small-sized denitrification catalyst chamber, chemical synthetic catalyst process that is excellent in shape selectivity, applying this material that has already acquired the patents in Japan and 13 countries in the world.



Solid-state synthesis microporous material



Schematic of system configuration