

Tanaka Lab.

Elemental Materials Chemistry

GSGES, Kyoto Univ.

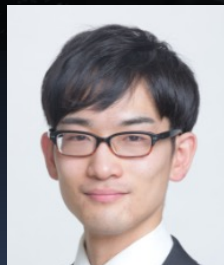
Prof. Kazuo TANAKA



Assistant Prof.
Masayuki GON



Assistant Prof.
Shunichiro ITO



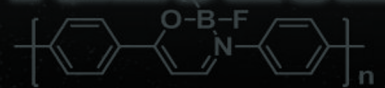
Students

Doctor Course: 2

Master Course: 10

Undergrads: 5

Function



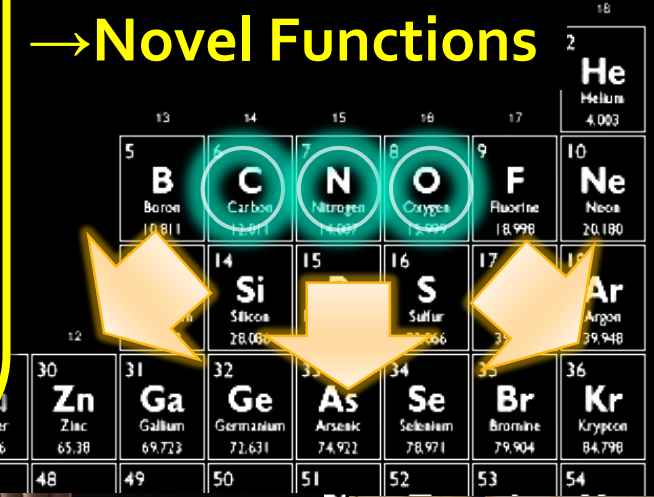
Application

Research Topics: "Elemental Materials"

70% of commercial polymers are composed only of C, H, O and N. Annual production: hundreds of millions of tons

Minimal Functional Units = "Element Blocks" Functional Polymer Materials

+ Various Elements → Novel Functions

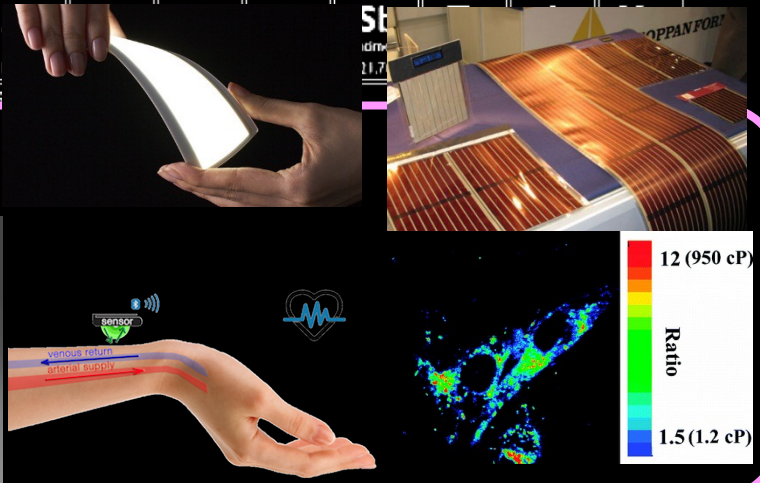


37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag
85.468	87.62	88.906	91.224	92.906	95.94	98.906	101.07	102.906	106.42	107.868
6	6	6	6	6	6	6	6	6	6	6

Applications

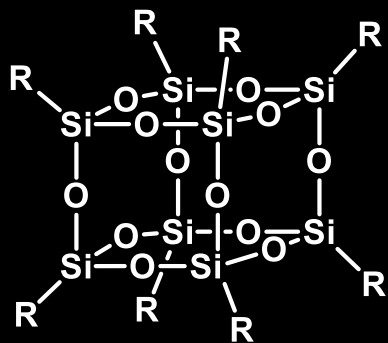
Shedding new light on functions derived from elements

- To solve existing problems
- To obtain novel materials

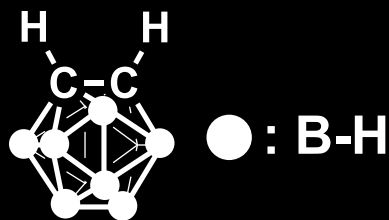


Acetium	Thorium	Protactinium	Uranium	Neptunium	Plutonium	Americium	Curium	Berkelium	Californium	Einsteinium	Fermium	Mendelevium	Nobelium	Lawrencium
227.028	232.038	231.036	238.029	237.048	244.064	243.061	247.070	247.070	251.080	[254]	257.095	258.1	259.101	[262]

Recent Examples of "Element Blocks"



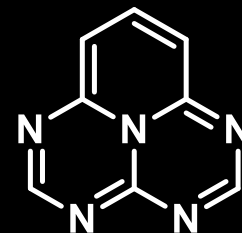
POSS



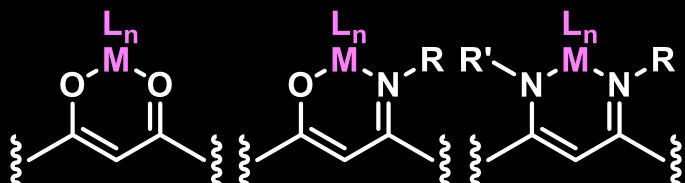
Carboranes



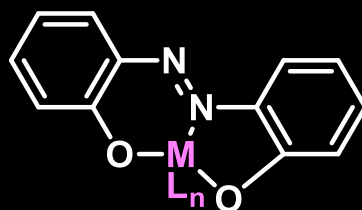
BODIPY



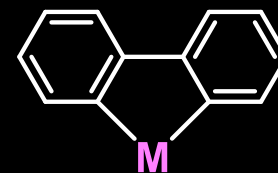
Azaphenalenes



Ketoiminates and Diiminates



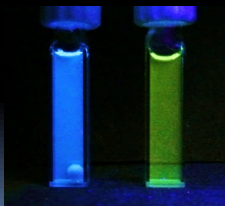
Azobenzenes



Metallafluorenes

Luminescent Materials

Detection of microplastics



Detection of the deterioration of fuel



Detection of mechanical stress

