Principal Researcher	Kazuhiro Nagata	**Number of Reserchers**	1
Research Institution・Department・Title	Professor, Graduate School of Science and Engineering, Tokyo Institute of Technology	**Location of Institution**	Meguro-ku, Tokyo

Title of Project	Development of New Process for Rapid Pig Iron Making with Less Emission of CO_2 at Lower Temperature and Higher Oxygen Potential
Abstract of Research Project	The new process for rapid pig iron making during 20 minutes at lower temperature of about 1350 ℃ by about 200 ℃ and higher oxygen potential of $1x10^{-12}$ atm than those of blast furnace will be investigated. The important researches of the process are ① reaction mechanisms in lower height furnaces, ② effective heat supply to reaction zone, ③ fundamental design of reaction furnace with high heat efficiency at low temperature, ④ separation method of gang elements without making slag, ⑤ continuous pig iron making process. The process of rapid pig iron making at lower temperature than blast furnace is apparently contradictory in view of kinetics. This process can be realized by controlling the surface and contact conditions of powders of iron ore and char. The reaction in blast furnace proceeds near equilibrium because of the usage of ore lump in high shaft furnace. In the present process, the cementation and melting of reduced iron proceed by the direct contact with solid carbon in non-equilibrium state under high oxygen potential. The characteristic of the present project is the investigation of analysis and controlling of the non-equilibrium state and the originality is the conception of this project from Tatara of the Japanese traditional process for making pig iron and steel.
References	・K.Nagata, R. Kojima, T. Murakami, M. Susa, H. Fukuyama and T. Murakami、Mechanisms of Pig Iron Making from Magnetite Ore Pellets Containing Coal at Low Temperature、Iron & Steel Inst. Japan.Intern.、Vol.41, No.11、p.1316-1323、2001. ・K.Nagata、Production Mechanisms of Steel Bloom and Pig Iron Using a Modified Small Tatara Furnace、Tetsu-to-Hagana、Vol.86, No.9、p.63-70、2000.
Term of Project	Fiscal years 2003-2007．（5years）

Budget Allocation (in thousand of yen)	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL
	27,800	22,500	9,800	18,300	5,800	84200

Homepage Address	http://www.cms.titech.ac.jp/seminar/function/func_02.html