

Multi Cell Sorter on a Chip

We have developed a new method of particle retrieve for a chip-based multi-cell sorter. Optical gradient force can change direction of target dielectric particles, such as cells, and retrieve particles against hydrodynamic force by irradiation of a laser in a microfluidics device. We are putting the developed method to practical use of a multi-cell sorter in a chip for applications of life science and medical technology.

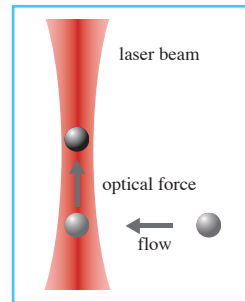


Figure 1: Concept of optical sorting. A dielectric particle such as biological cell, is moved to laser beam focus by optical gradient force, when the particle comes into beam irradiated region.

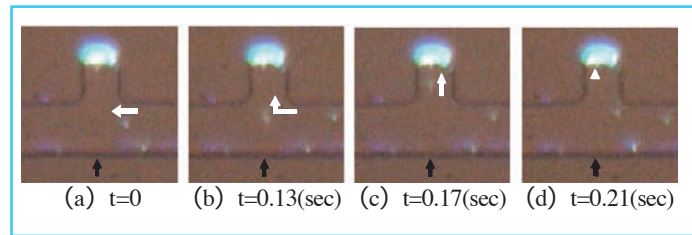


Figure 2: Sequential photographs of a single 2µm bead recovery by focused Nd:YAG laser (1064nm in wavelength) denoted as black arrow. The bead was deflected to vertical direction against flow one by optical gradient force (white arrow).

Ken Hirano

Health Technology
Research Center

E-mail:

hirano-ken@aist.go.jp

AIST TODAY Vol.5, No.10 (2005)
p.22-23

Nanotechnology , Materials & Manufacturing

Development of a high strength Fe–Cr alloy without a brittle sigma phase using a novel powder method

Fe-48at%Cr alloy has been synthesized using mechanical alloying (MA) of Fe and Cr powder and consolidated using pulsed current sintering (PCS). The obtained Fe-48at%Cr alloy has consisted of fine grains without a brittle sigma phase, which precipitated inevitably in Fe-48at%Cr cast alloy. Fe-48at%Cr alloy fabricated by the newly proposed process (MA-PCS) has showed a high strength of over 1GPa and a high elongation more 10% at room temperature.

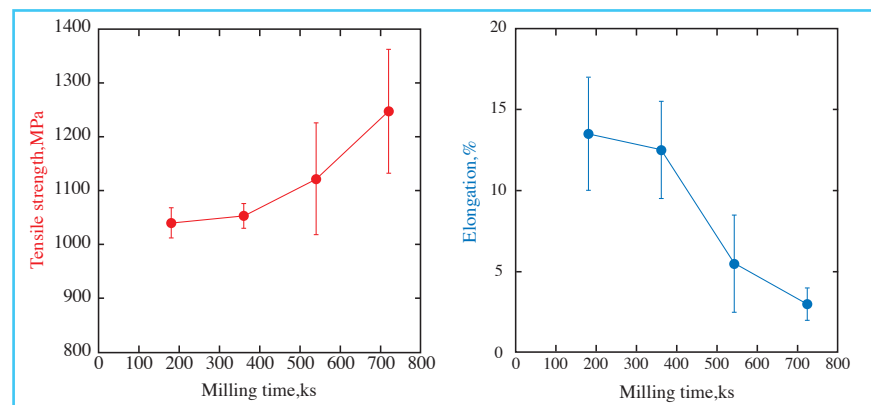


Figure: Effect of milling time on mechanical properties of Fe-48at%Cr compacts.

Toshiyuki Nishio

Materials Research Institute for
Sustainable Development

E-mail:

t-nishio@aist.go.jp

AIST TODAY Vol.5, No.10 (2005)
p.24-25