

Since grinding conditions can have an effect on surface modification, detailed analyses ~~of were made on~~ the relationships among condition parameters were conducted. ~~between them~~ One ~~of the~~ findings of the analyses was that using a sodium hydroxide-base grinding fluid modified the composition of ~~a the~~ titanium alloy surface into ~~an~~ amorphous sodium titanate ~~that resulted in which provided~~ the workpiece surface ~~becoming bioactive; with a bioactivity;~~ the surface ~~was able became~~ to educt hydroxyapatite, which is the main component of ~~the~~ human bone, in ~~a~~ simulated body fluid. This ~~finding could be applied to function can~~ improve engraftment of biomaterials to the human bone.

Grinding wheels, ~~which and the workpieces~~ are in ~~continuous~~ contact with ~~workpieces each other continuously~~ during grinding, ~~become to make them~~ highly activated thermodynamically and chemically at the contact point. The applicant found that this activation phenomenon caused diffusion of components of grinding wheels or grinding fluids to the workpiece surface and ~~that~~ some elements in the components could enhance the strength, fatigue resistance, and wear resistance of the surface. This diffusion and enhancement mechanism can ~~add value be value adding in~~ not only ~~in~~ medical but also ~~in~~ industrial fields; it contributes to ~~improved improving~~ adhesion between the workpiece surface and hard anodic oxidation coatings, as well as producing microtools with sub-10 μm diameters at the ~~contact~~ point (~~achieved~~ 1 μm ~~smallest achieved as smallest~~).

The standard sample ~~used to determine a for basic~~ characteristic measurement of the developed system was a composite made of 1 vol% iron particles dispersed in polystyrene resin. ~~Chips of~~ Polystyrene resin ~~chips~~ were dissolved in acetone and commercially available iron particles were mixed ~~into the solution with the dissolved acetone~~. The ~~average~~ particle size of iron ~~partiele~~ was 1.7 μm ~~which~~ was measured by a laser diffraction particle size analyser. ~~The average size was 1.7 μm . After mixing,~~ The mixture was heated to melt the polystyrene resin and ~~was~~ then hot-pressed ~~and~~. This ~~was~~ allowed to cool naturally to room temperature. ~~After cooling, the mixture, and~~ was processed into a rectangular shape (25 \times 25 \times 5 mm) ~~to of 25 \times 25 \times 5 mm fit to set into~~ the sample case. To confirm the magnetization of the standard sample, ~~it magnetization~~ was measured ~~using by a~~ Magnetic Property Measurement System SQUID VSM (Quantum Design). Figure 2 shows the magnetization curve of the standard sample in the ~~range from~~ -100 to 100 mT ~~range~~. ~~The This standard~~ sample showed a hysteresis curve and was found to be ~~magnetized sufficiently~~ in the magnetic field range ~~that where~~ the developed system ~~is capable of generating can generate~~. ~~To establish a comparative For the measurement of~~ weak magnetic signal, ~~pure water was used as a sample filling~~ the sample case ~~was filled~~ with pure water ~~and the signal from the water was measured~~.