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## Mechanism of metal removal from CD-ROM by pulsed power

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Recycling of valuable materials such as metals and plastics is regarded as important from the viewpoint of resource conservation and environmental protection. In recent years, application of pulsed power technology to the recycling field has attracted attention. The authors have been investigating on metal and plastic separation from optical discs using pulsed power. In this study, CD-ROM was used as a separation processing target. A magnetic pulse compression pulsed power generator was used to provide a positive pulsed voltage to the electrodes on a CD-ROM. The coating layer containing metal was separated from the plastic substrate in the atmospheric air. However, details of the mechanism of metal separation were not revealed. In order to clarify a mechanism of metal separation, the authors have investigated the discharge formation by a high speed camera. As a result, two different type discharges have been observed at the first shot; one is the dielectric breakdown of the protective layer, and the other one is the surface discharge. There was no effect on metal separation by the surface discharge. Therefore, the surface discharge observed at the first shot was supposed to be a streamer-like discharge. Furthermore, burning and shock wave were observed by knife-edge Schlieren method. Pulsed voltage was applied to a rod-rod electrode on the CD-ROM. Burning and shock wave due to large current have been observed during metal separation. The Mach number was calculated from the image of the shock wave obtained by Schlieren method.

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