

CHAPTER V

CONCLUSIONS

In the present study, we investigated triboelectric charging of a two-component developer on print quality in electrophotography. It can be concluded that various factors affect the charging properties, in terms of q/m , as follows: the toner concentrations, carrier types and charging mechanism. A higher toner concentration yields a lower q/m value. The coverage of the toner particles on the carrier surface increased, and toner particles formed more than one layer as toner concentration increased. The outer layer had some free toner particles that could not be charged by rubbing with the carrier particles. The q/m values of the carrier particles composed of only Fe (F-150) were higher than those of carrier particles containing Fe, Cu and Zn (TSV-200 and Z-250) because the former has a higher work function than the latter. Various charging mechanisms resulted in different q/m values. The q/m values from the vertical mixing method with 800 rpm were higher than those of horizontal mixing method with 120 rpm. In contrast, the smaller q/m values were observed at lower concentration due to the effects of the higher mixing force and the greater toner rubbing and collision. The print quality was measured on the solid density, tone reproduction, sharpness of the alphabets and lines, color gamut and gamut volume in color charts. Print-outs from the polymerized toners and pulverized toners produced equally the same tone reproduction. Basically, the polymerized toner has the spherical shape while the pulverized toner has the irregular shape. The spherical shaped toner is more efficiently, uniformly and triboelectrically charged than the irregular shaped

toner. Therefore, the sharpness of the alphabets and lines of the polymerized toner print-outs were sharper and smoother than those printed by the pulverized toner. The color gamut and gamut volume of the polymerized toner print-outs were wider than those printed by the pulverized toner. However, the solid density of the former print-outs was lower than the latter because the print-out with polymerized toner has a lower gloss than those with pulverized toner. The solid density depends on gloss of print-out. Thus, the print-out has the high gloss, so it has the high density. Moreover, the major attribute to different solid densities can also be due to the types of pigments and additives of the toner. The thermal property showed that the toner can fuse at low temperature, which enhanced the quality of print and save energy.



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