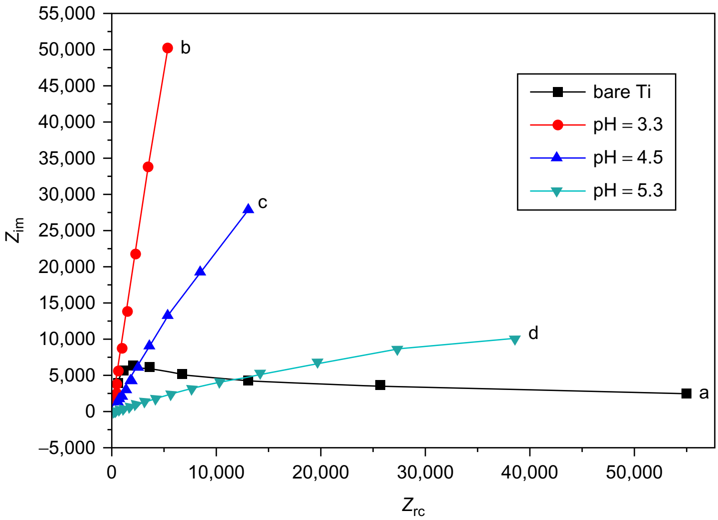

FIG. 1.7 Impedance spectra of (a) uncoated Ti substrate, and CS-BG-HA composite coated Ti substrate fabricated at (b) pH 3.3, (c) pH 4.5, and (d) pH 5.3 at 20 V for 15 min in C-SBF at 37°C. *(Reproduced with permission from Molaei, A., Yari, M., Afshar, M.R., 2015. Modification of electrophoretic deposition of chitosan-bioactive glass-hydroxyapatite nanocomposite coatings for orthopedic applications by changing voltage and deposition time. Ceram. Int. 41, 14537–14544 of Elsevier.)*

of the pH at the cathode surface. On the other hand, the deposition of alginate during EPD is due to the decrease of the pH at the anode surface.

Table 1.2 presents an overview of coatings produced by EPD in which BG particles have been combined with a variety of polymers.

1.5 INCORPORATION OF DRUGS

A suitable strategy against bacterial infections includes the incorporation of different biological agents such as antibiotics into composite coatings created by EPD. Patel et al. (2014) developed composite coatings of chitosan and nano-BG with ampicillin to study the loading and release of the drug. The initial continuous drug release was ascribed to the degradation of the coating surface, as it showed a linear dependence on time. The faster release of the drug was associated with a more rapid coating degradation. After a certain time, the drug was released mainly through the surface coating layer. In general, when surface erosion progresses, drugs present at the surface are readily released, while the ones in the deepest regions could be still diffusing out. The antibacterial effects of ampicillin using an agar diffusion test showed an antibacterial effective zone around the ampicillin-loaded coating at 24 h. This zone was maintained and increased for up to 5 days. Clifford et al. (2017) deposited poly(styrene-*alt*-maleic-acid) (PSM) to enhance the deposition of inorganic fillers. PSM showed