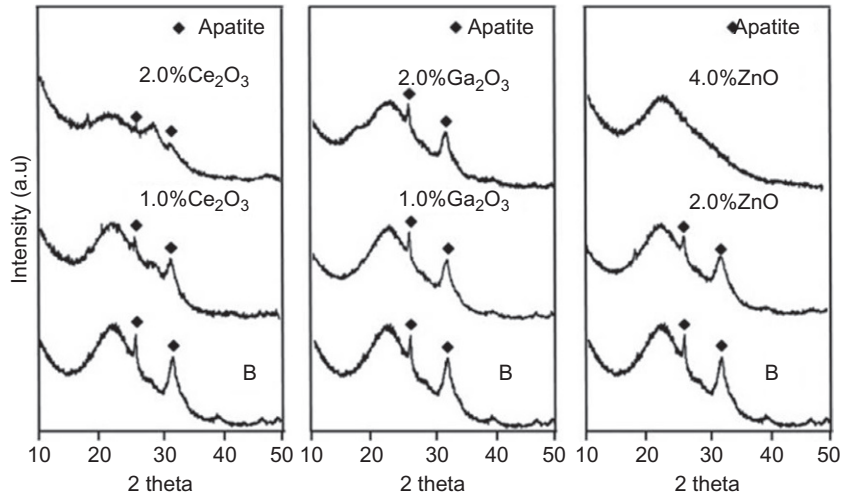

FIG. 14.10 XRD patterns after 7 days of SBF soaking of cerium, gallium and zinc substituted MBGs. XRD, X-rays diffraction; SBF, simulated body fluid; MBG, mesoporous bioactive glasses (Shruti et al., 2013).

found for glasses doped with gallium and copper, but the loss in bioactivity was related to the effects of therapeutic ions on glass dissolution, as long as glass dissolution and bioactivity are correlated phenomena. Fig. 14.10 shows the results of a bioactivity test performed by Shruti et al. (2013), who found that the zinc oxide content in the glass composition could inhibit glass bioactivity.

Therapeutic ions have an influence on glass dissolution and bioactivity, but it is not limited to them. Other properties may be affected like mechanical response, surface roughness, topology, and texture, among others. These other properties will not be covered here because they are beyond the scope of this chapter, although they should be taken into account along with the development of glass composition, and depending on the application aimed for this glass.

14.2.3 Antibacterial Activity of BGs for Release of Molecules

BGs can also be used to release biomolecules like antibiotic and antiinflammatory drugs, growth factors, proteins, enzymes, and genes. These materials, especially silica-based mesoporous glasses, have attracted much interest due to their structure, which allows incorporation of large amounts of therapeutic agents (Bagherifard, 2017).

Local drug delivery presents some advantages, when compared with systemic drug delivery, because of its higher efficiency, lower toxicity, and the possibility of continuous action (Wu and Chang, 2014). A biomolecule is either loaded into BGs or BG/polymer composites. When carried into BG, the