form hydrogen bonding with drug molecules, resulting in an improved binding of the drug to the surfaces of samples (Marzouk and Abdel-Hameed, 2017).

5.7 CONCLUSIONS

The introduction of the biomaterials for the bone repair devices is challenging from an engineering and biological point of view. In the field of biomaterials research, degradable materials for bone repair and regeneration are positively sought and have generated tremendous interest due to their biodegradable nature, use in orthopedic surgery, and reduction in the pain and cost to patients. Natural and synthetic polymers and bioceramics are already in clinical use as biodegradable materials, Different biomaterials have different mechanical properties, biological behavior, and degradable mechanism. This article has demonstrated that the biomaterial containing borate particles form a strong bond with the host tissues. Borate glass particles rapidly degradable and exhibit no considerable adverse effect on cells. The quick deposition of HA on the surface of borate glass is considered to be a strong reason for its bioactivity. Borate bioactive glass is a promising material for the fabrication of scaffolds, possessing the porosity necessary for the growth of the tissues. The deposition of HA-like material, controlled release of antibiotics, provision of substantial strength to the new bone, and support bone regeneration make 3D scaffolds of borate bioactive glass ideal candidates for tissue engineering and fighting bone related infections.

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