(1 month), with lower initial burst (21%) when compared with noncoated scaffolds (initial burst of 77% and release time of 4 days).

Besides the development of scaffolds, BG/polymer composites are used for producing injectable materials, which have the advantage of filling nonuniform fractures, once they work like cements. Cui et al. (2014) mixed borate BG with vancomycin in a solution of chitosan, and used this material as an injectable cement to treat osteomyelitis. In vitro tests showed release of vancomycin over ~25 days with transformation of borate glass into hydroxyapatite when immersed in phosphate-buffered saline. They also performed in vivo tests by infecting tibias of rabbits with methicillin-resistant *S. aureus*, and treating these animals with injectable vancomycin-loaded borate BG cement. After 8 weeks, they observed that all BG was converted to hydroxyapatite, forming a new bone tissue, and healing of osteomyelitis occurred in 87% of the cases. The authors suggested that injectable vancomycin-loaded borate BG cement is a promising system for treatment of osteomyelitis and regeneration of bone.

The amount of glass within the polymer structure is a factor that can influence drug release. BG 46S6 was used by Mabrouk et al. (2014) to prepare composite scaffolds with polyvinyl alcohol and loaded with broad spectrum antibiotic ciprofloxacin during the fabrication. They used different ratios of glass content and observed that an increase of glass content results in lower degradation rate and improved mechanical properties. These scaffolds also showed a prolonged release pattern and can offer a more efficient treatment for osteomyelitis.

Coatings with different polymers can be used to improve the control of drug release, as demonstrated by Fereshteh et al. (2015), who prepared porous scaffolds of BG 45S5 and coated them with a thin layer of polycaprolactone (PCL) and zein. The authors pointed that zein has a hydrophilic nature and higher concentration of this polymer in relation to PCL, resulting in an increase in the coating degradation rate and faster drug release. This outcome made it possible to control the drug release rate by changes in the percentage of zein in relation to blend PCL/zein composition.

Scaffolds can also be prepared to deliver multiple drugs, as shown by García-Alvarez et al. (2017), who produced scaffolds to deliver three different drugs. They used a mesoporous glass matrix with dispersed nanoparticles of apatite. This material was impregnated with levofloxacin, which was mixed with polyvinyl alcohol—vancomycin solution, and 3D scaffolds were prepared using rapid prototyping. Then these scaffolds were coated with gelatin—glutaraldehyde containing rifampin. According to the authors, three antimicrobial drugs (levofloxacin, vancomycin, and rifampin) loaded in different layers of the scaffold can be used to obtain different release rates and improve the treatment of infection (Fig. 14.13). They obtained two profiles of the drug releasing: (1) an initial and fast release of rifampin and (2) a sustained and longer release of levofloxacin and vancomycin, resulting in an effective treatment against both Gram-positive and Gram-negative bacteria biofilms.

Considering all the works presented above, the development of a system containing BGs and polymers can be considered promising for use in bone