

**Hayati, Bahman**

**Completely continuous Banach algebras.** (English) Zbl 1370.46028  
*Int. J. Nonlinear Anal. Appl.* 7, No. 1, 301-308 (2016).

Author's abstract: For a Banach algebra  $\mathfrak{A}$ , we introduce  $c.c(\mathfrak{A})$ , the set of all  $\phi \in \mathfrak{A}^*$  such that  $\theta_\phi : \mathfrak{A} \rightarrow \mathfrak{A}^*$  is a completely continuous operator, where  $\theta_\phi$  is defined by  $\theta_\phi(a) = a \cdot \phi$  for all  $a \in \mathfrak{A}$ . We call  $\mathfrak{A}$  a completely continuous Banach algebra if  $c.c(\mathfrak{A}) = \mathfrak{A}^*$ . We give some examples of completely continuous Banach algebras and a sufficient condition for an open problem raised for the first time by *J. E. Galé* et al. [*Trans. Am. Math. Soc.* 331, No. 2, 815–824 (1992; [Zbl 0761.46037](#))]: Does there exist an infinite-dimensional amenable Banach algebra whose underlying Banach space is reflexive? We prove that a reflexive, amenable, completely continuous Banach algebra with the approximation property is trivial.

Reviewer: [Andrzej Sołtysiak \(Poznań\)](#)

**MSC:**

- [46H25](#) Normed modules and Banach modules, topological modules (if not placed in 13-XX or 16-XX)
- [46H20](#) Structure, classification of topological algebras
- [46B10](#) Duality and reflexivity in normed linear and Banach spaces

**Keywords:**

amenability; completely continuous; Banach algebra amenability; completely continuous; Banach algebra

**Full Text:** [DOI](#)