SHARP UPPER BOUNDS ON THE CLAR NUMBER OF FULLERENE GRAPHS

YANG GAO

School of Traffic and Transportation
Lanzhou Jiaotong University
Lanzhou, Gansu 730070, P.R. China

e-mail: gaoy@mail.lzjtu.cn

AND

HEPING ZHANG

School of Mathematics and Statistics
Lanzhou University
Lanzhou, Gansu 730000, P.R. China

e-mail: zanghp@lzu.edu.cn

Abstract

The Clar number of a fullerene graph with \( n \) vertices is bounded above by \( \lfloor n/6 \rfloor - 2 \) and this bound has been improved to \( \lfloor n/6 \rfloor - 3 \) when \( n \) is congruent to 2 modulo 6. We can construct at least one fullerene graph attaining the upper bounds for every even number of vertices \( n \geq 20 \) except \( n = 22 \) and \( n = 30 \).

Keywords: fullerene, Clar number, Clar set, leapfrog transformation.

2010 Mathematics Subject Classification: 05C10, 05C62, 05C70, 92E10.

References


\(^1\)This work is supported by NSFC (grant no. 11371180), and the Fundamental Research Funds for the Central Universities (grant nos. lzujbky-2017-ct01, lzujbky-2016-ct12).

\(^2\)Corresponding author.

doi:10.1016/j.dam.2015.08.007

doi:10.1007/978-1-4613-0163-9

doi:10.4153/CJM-1963-071-3

doi:10.1016/j.dam.2013.06.009


doi:10.1016/j.dam.2009.06.007

doi:10.1016/0166-218X(95)00081-2


doi:10.1007/s10910-010-9706-2

Received 12 February 2016
Revised 26 October 2016
Accepted 26 October 2016