Zhu, Xuding
Graphs whose circular chromatic number equals the chromatic number. (English)
Combinatorica 19, No. 1, 139-149 (1999).

The circular chromatic number of a graph is the infimum (in fact, the minimum) of $k/d$ where there is a coloring $f$ of the vertices with colors $1, 2, \ldots, k$ in such a way that $d \leq |f(x) - f(y)| \leq k - d$ holds when $x, y$ are adjacent. Based on the notion of $n$-circular superedge, constructions are given for graphs with the chromatic number being equal to the circular chromatic number in the style of Hajós’ method for constructing all $n$-chromatic graphs. This way, several new planar graphs are constructed, thus settling some earlier problems.

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