

## Classification of Fullerene Isomers from C<sub>40</sub> to C<sub>48</sub>

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**Abstract.** We have designed possible structures of the isomers of midi-fullerenes, namely C<sub>40</sub>, C<sub>42</sub>, C<sub>44</sub>, C<sub>46</sub>, and C<sub>48</sub>; three the most natural mechanisms of their formation being used: fusion of carbon cupolas having the same symmetry; fusion of fullerenes having compatible symmetry and embedding carbon dimers into initial fullerenes. The energies of the fullerenes calculated through the use of molecular mechanics are presented together with their graphs. It is found that in the majority of cases the minimum-energy fullerenes are those, which have tetrahedral symmetries. The maximum-energy fullerenes refer to the three-fold T-symmetry.

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