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On Hosoya's dormant and sprouts

Study of cospectral graphs is a traditional topic of spectral graph theory. Haruo Hosoya recently drew attention to a particular aspect of constructing cospectral graphs using coalescences: that cospectral graphs can be constructed by attaching multiple copies of the same rooted graph in different ways to subsets of vertices of an underlying graph. We address expectations and questions raised in Hosoya's papers, and present an explicit formula for the characteristic polynomial of such multiple coalescences, establishing a necessary and sufficient condition for their cospectrality in the case when the attached rooted graph may be arbitrary.

(Joint work with Salem Al-Yakoob.)