

SEARCH FOR RESONANCES IN THE $^{12}\text{C}+^{11}\text{B}$ REACTION CROSS SECTION

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Besides the clear cut cases $^{12}\text{C}+^{12}\text{C}$ and $^{16}\text{O}+^{12}\text{C}$ there exist several other light heavy ion systems for which the existence of molecular resonances has been reported or is expected due to experimental results or existing systematics, respectively. Among the latter systems is $^{12}\text{C}+^{11}\text{B}$ for which narrow structures have been found in the excitation functions of the α -particle, the ^8Be , the elastic and inelastic channels ¹⁾.

We have performed γ -yield measurements for the $^{12}\text{C}+^{11}\text{B}$ reaction in order to see if the structures of Ref.1 pertain in the semi-total reaction cross sections of the most prominent exit channels. Measurements have been carried out in the energy range $E_{\text{cm}} = 9.8-17.2$ MeV in steps of approximately 120 keV using a Ge(Li) detector. The exit channels investigated were $^8\text{Be}+^{15}\text{N}$, $^5\text{Li}+^{18}\text{O}$, $^5\text{He}+^{18}\text{F}$, and $d+^{21}\text{Ne}$. Fig.1 shows the preliminary results. The curves for the individual exit channels are flat as is the summed excitation function (shown on top of fig.1) which can be taken as a rough measure of the total reaction cross section. There is only one structure at $E_{\text{cm}}=10.5$ MeV which does, however, not coincide with any resonance energy of Ref.1. Assuming that molecular resonances show up in the total reaction cross sections of particular exit channels (for instance in the $^8\text{Be}+^{15}\text{N}$ channel) we conclude that the most prominent exit channels do not contain molecular resonances (with the exception of the structure at 10.5 MeV), in particular the ^8Be exit channel for which resonances were reported in ¹⁾.

1) A.D. Frawley, J.F. Mateja, A. Roy, and N.R. Fletcher;
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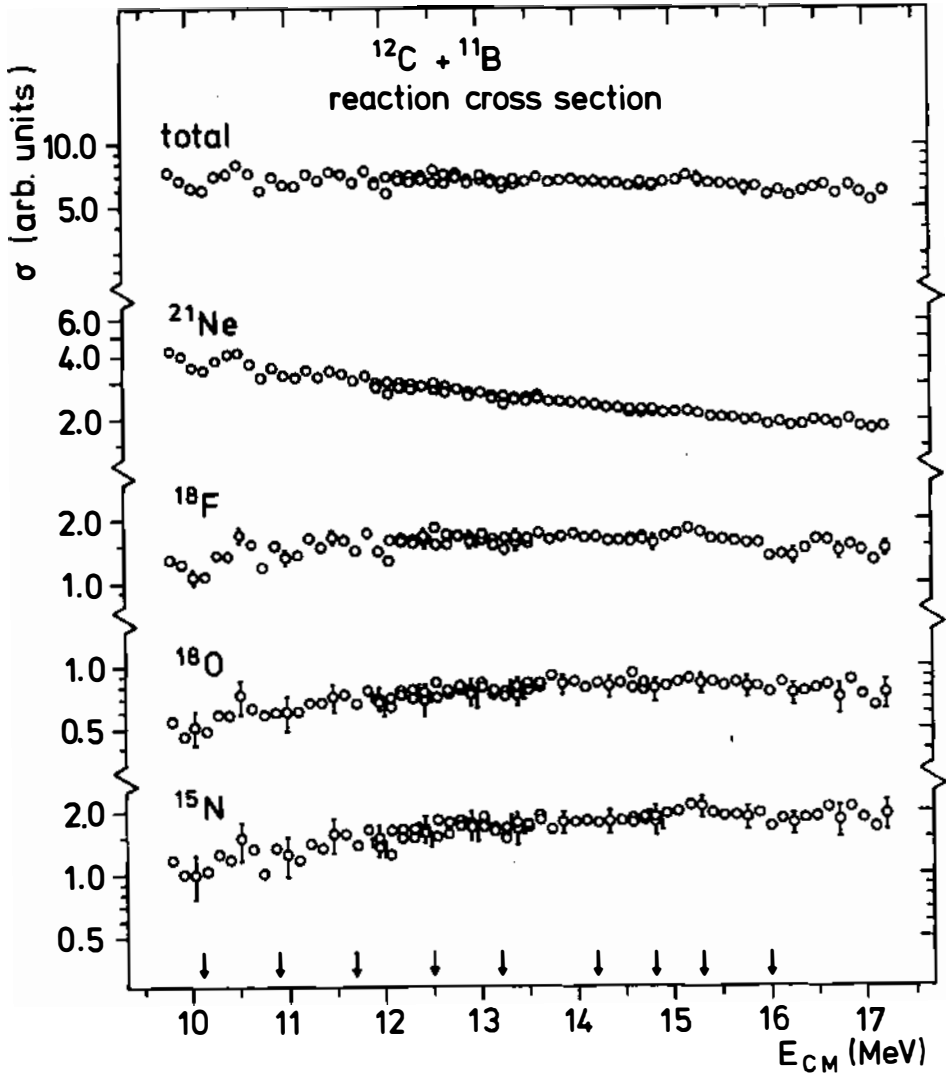


Fig.1 Excitation functions of the summed yield and several individual exit channels of the $^{12}\text{C} + ^{11}\text{B}$ reaction.