

Table 12.53 from (2017KE05):  
 Experimental studies of  $^{12}\text{C}(\pi^+, \pi^-)^{12}\text{O}$  double charge exchange reactions

Reactions	$E_\pi$ (MeV)	Measurements	Reference
$^6, ^7\text{Li}, ^9\text{Be}, ^{12}\text{C}(\pi^+, \pi^-), (\pi^-, \pi^+)$	120-270	$\sigma(\theta, E_{\pi^-})$	(2007FO05)
$^7\text{Li}, ^{12}\text{C}, ^{16}\text{O}, ^{56}\text{Fe}(\pi^+, \pi^-)$	30-90	$\sigma(\theta, E_{\pi^-})$	(2000DR19)
$^{12}\text{C}, ^{24}\text{Mg}, ^{32}\text{S}, ^{40}\text{Ca}(\pi^+, \pi^-)$	164	$\sigma(\theta)$	(1991WA04)
$^{12}\text{C}, ^{16}\text{O}, ^{44}\text{Ca}, ^{56}\text{Fe}(\pi^+, \pi^-)$	100-300	$\sigma(\theta)$ vs $E$ in $\Delta$ resonance region	(1990SE11)
$^4\text{He}, ^6, ^7\text{Li}, ^9\text{Be}, ^{12}\text{C}, ^{16}\text{O}, ^{40}\text{Ca}, ^{103}\text{Rh}, ^{208}\text{Pb}(\pi^+, \pi^-), (\pi^-, \pi^+)$	180, 240	$\sigma$ , target $A/Z$ systematics	(1989GR06)
$^{12}\text{C}(\pi^+, \pi^-)$	50-120	$\sigma(\theta), \sigma(\theta)$ vs $E, \sigma(E_{\pi^-})$ ; deduced $\sigma$ energy dependence	(1987FA05)
$^{12}\text{C}, ^{24}\text{Mg}, ^{28}\text{Si}, ^{32}\text{S}, ^{40}\text{Ca}(\pi^+, \pi^-), (\pi^-, \pi^+)$	120-210	$\sigma(\theta, E_{\pi^-})$	(1985MO18)
$^{12}\text{C}, ^{24}\text{Mg}, ^{28}\text{Si}, ^{32}\text{S}, ^{40}\text{Ca}(\pi^+, \pi^-)$	120-210	$\sigma(\theta = 5^\circ)$ vs $E$ , target $A/Z$ systematics	(1983BL08)
$^9\text{Be}, ^{12}, ^{13}\text{C}, ^{16}\text{O}, ^{24}\text{Mg}, ^{32}\text{S}(\pi^+, \pi^-)$	180	$\sigma(\theta), ^{12}\text{O}$ mass	(1980BU15)
$^{12}\text{C}, ^{40}, ^{44}, ^{48}\text{Ca}(\pi^+, \pi^-), (\pi^-, \pi^+)$	290	$\sigma(E_{\pi^-})$	(1979DA16)