Table – 1 Some selected compounds of Coumarin with Pharmacological and Industrial properties

Substrates	Properties	Ref
	Anticoagulant	16,17
O Me Me Me	Anticoagulant	16,17
OH Et	Hypo epidemic1	17
R <sup>5</sup> R <sup>5</sup> R <sup>2</sup>	Anti allergic	17a
R <sup>1</sup> CO <sub>2</sub> Et	Anti inflammatory	18
O O O O O O O O O O O O O O O O O O O	Anti hypertension	19

 ${\sf Table-1\ Some\ selected\ compounds\ of\ Coumarin\ with\ Pharmacological\ and\ Industrial\ properties}$ 

Substrates	Properties	Ref
O Me Me Ph	Anti inflammatory	20
O—CH <sub>2</sub> CH <sub>2</sub> —N	Schistomiacide	20
O Me Me	Metamorphosis activity of insect	21
Me Me O O	Hypertensive	22
N—CH <sub>2</sub> Ph	Hypertensive	22
O OR OR OR	Hypertensive	22

Table – 1 Some selected compounds of Coumarin with Pharmacological and Industrial properties

Substrates	Properties	Ref
NO <sub>2</sub> X= O or S	Anti tubercular	23
O Ph Me	Anti coagulant	23a
OH OH	Anti inflammatory & Anti microbial	24,25
MeO O O O		

Substrates	Products	Ref
CO <sub>2</sub> Et  O  O  CO <sub>2</sub> Et	CO <sub>2</sub> Et	63
CO <sub>2</sub> Et OZnBr	H <sub>IIIII</sub> CO <sub>2</sub> Et	65
MeO O O Br CO <sub>2</sub> Et	MeO $MeO$ $R=H$ $R=Me$	66

## Table

MeO O O O R R R=Me R=H	Br CO <sub>2</sub> Et	MeO $MeO$ $R=H$ $R=Me$	66
MeO O O Br	Et CO <sub>2</sub> Et	CO <sub>2</sub> Et  Me  Et	66
R=Me R=H		R R= H R=Me	

Substrates		Products	Ref
R 8 0 2 0 R= H CHO R= OMe	Br CO <sub>2</sub> Et	R O O O O O O O O O O O O O O O O O O O	67
		EtO OH R1	
		$R^1$ = Me, Et, CHMe <sub>2</sub> CH	
	_	R= H, Me	
R 8 0 2 0 0 R=H CHO	Br   H <sub>3</sub> C	CH CCO <sub>2</sub> Et	67
R= OMe		R CO <sub>2</sub> Et	
		HO CO <sub>2</sub> Et	
		R O R1 R3 R3 R2	
		R=R <sup>2</sup> =H, R <sup>3</sup> =CMe <sub>2</sub> CO <sub>2</sub> Et R=R <sup>3</sup> =H, R <sup>2</sup> =CMe <sub>2</sub> CO <sub>2</sub> Et R=OMe, R <sup>1</sup> =R <sup>3</sup> =CMe <sub>2</sub> CO <sub>2</sub> Et, R <sub>2</sub> =H	

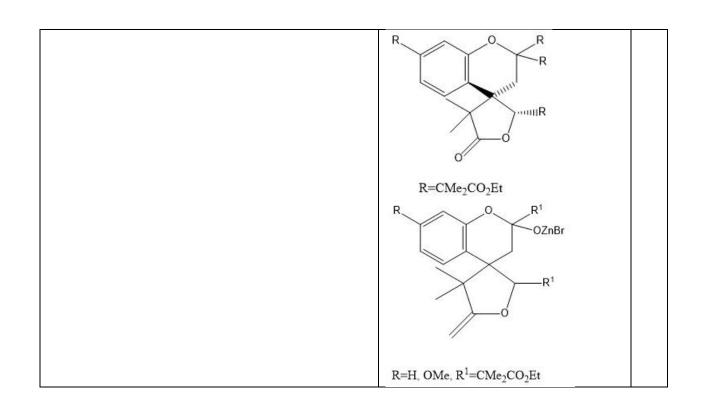


Table -3 Selected Examples of Reformatsky Reaction with Coumarins/uncommon electrophiles

Substrates	Products	Ref
Ph Me Br CO <sub>2</sub> Et	Ph Me Me NH CO <sub>2</sub> Et	69
Ph Br CO <sub>2</sub> Et	Ph Me Ph N Ph Ph Me CO <sub>2</sub> Et	69
R <sup>2</sup> ////////////////////////////////////	R <sup>1</sup> R <sup>2</sup> IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	70
	Mellining H	
OAc OAc Br CO <sub>2</sub> Et	O OH	71
	N R	

Table -3 Selected Examples of Reformatsky Reaction with Coumarins/uncommon electrophiles

Substrates	Products	Ref
NH CO <sub>2</sub> Et	HO CO <sub>2</sub> H	77
	EtO <sub>2</sub> C R R CO <sub>2</sub> Et	
Ph CO <sub>2</sub> Et	Ph—OH OH	72
	Ph P	
R <sup>1</sup> CO <sub>2</sub> Et	$R^1$	73
$R^1$ $O$ $R^1$ $R^2$ $Br$ $CO_2Et$	R <sup>1</sup> O R <sup>1</sup> R <sup>2</sup> OH R	73

Table -3 Selected Examples of Reformatsky Reaction with Coumarins/uncommon electrophiles

Substrates	Products	Ref
$C^2$ — $CN$ $CO_2$ Et	CMe <sub>2</sub> CO <sub>2</sub> Et	74
$RCH = N(O) R^{7} R^{2}CR^{3} BrCO_{2} R^{4}$		
	$R^{1}$ $R^{1}$ $R^{3}$ $R^{3}$	75
	R= Me. $R'$ = p-OMe-C <sub>6</sub> H <sub>4</sub> or, R= Me, Et, CHMe <sub>2</sub> , CHPh <sub>2</sub> , $R'$ = Ph $R^2$ = $R^3$ = H, $R^4$ = Et/, CMe ; $R^2$ = $R^3$ = Me, $R^4$ = Et	
O NRR¹ BrCR²R³CN/Zn	OH-(CH <sub>2</sub> ) <sub>4</sub> CH(NRR <sup>1</sup> )CR <sup>2</sup> R <sup>3</sup> CN $R = Me. R' = p-OMe-C_6H_4$ or, R= Me, Et, CHMe <sub>2</sub> , CHPh <sub>2</sub> , R'= Ph $R^2 = R^3 = H,  R^4 = Et/, CMe$	75
CHO RCHBrC= CR <sup>1</sup>	R=Me. R'=p-OMe-C <sub>6</sub> H <sub>4</sub> or, R=Me, Et, CHMe <sub>2</sub> , CHPh <sub>2</sub> , R'=Ph	75

Table -4 Selected Examples of Grignard Reaction with Coumarins

Substrates	Products	Ref
MeO O O	$R^2$ $R$ $R$ $R$ $R$	101, 102
RMgX R= Me, Et, Me <sub>2</sub> CH <sub>2</sub> , Ph, P-anisyl	R= Ph, R <sup>1</sup> = H <sub>1</sub> R2= MeC <sup>1/</sup> (OH)Ph R= P-Anisyl, R <sup>1</sup> H R2=MeC(OH)Anisyl-P R,R <sub>1</sub> = Me, R <sub>2</sub> =MeC <sup>1/</sup> =C <sup>2/</sup> (H <sub>2</sub> ) R=Et, R <sup>1</sup> =Me, R <sup>2</sup> =MeC <sup>1/</sup> (OH)Et R=Pr <sup>1</sup> , R <sup>1</sup> = Me, R <sup>2</sup> =MeC <sup>1/</sup> , C <sup>2/</sup> Me <sub>2</sub> R=(CH <sub>2</sub> ) <sub>2</sub> Ph, R <sup>1</sup> = Me R <sup>2</sup> = MeC <sup>1/</sup> (OH)(CH <sub>2</sub> ) <sub>2</sub> Ph R= Ph, R <sup>1</sup> = Me, R <sup>2</sup> = MeC(OH)Ph R=P-Anisyl, R <sup>1</sup> = Me R2=P-AnisylC <sup>1/</sup> =C <sup>2/</sup> H <sub>2</sub>	
MeO Me	MeO OH MeO OH	101
	MeO O R	
	MeO OH OH	

Table -4 Selected Examples of Grignard Reaction with Coumarins

Substrates	Products	Ref
MeO O O	MeO R	102
Me	R	
RMgX R= Me, Et,i-Pr,Ph, p-Anisyl	R= Me, R <sup>1</sup> =Me=CH <sub>2</sub> R=Et, R <sup>1</sup> =MeC(OH)Et R= CHMe <sub>2</sub> , R <sub>1</sub> =Me=C(Me) <sub>2</sub> R=Ph, R <sub>1</sub> =MeC(OH)Ph R=p-Anisyl, R <sup>1</sup> = p-Anisyl C=CH <sub>3</sub> R=Me, R <sup>1</sup> =CH(OH)Me R=Et, R <sup>1</sup> =CH(OH)Et R=CHMe <sub>2</sub> , R <sup>1</sup> = CH(OH)CMe <sub>2</sub> R=Ph, R <sup>1</sup> =CH(OH)CPh <sub>2</sub>	
R O O	R=p-Anisyl, R <sub>1</sub> =CH(OH)C p-Anisyl	
R1-MgX R1=Ph. EtPr. But. p-Anisyl	H C R' C QCH	126
R=H R=OMe	R.R.=H. R.2=OH R=OMe, R.=H. R.2=OH R=H. R.1=Ph. R.2=OAc R=OMe, R.1=Ph. R.2=OH R=H. R.1=P-Anisyl, R.2=OAc R=OMe, R.1=P-Anisyl, R.2=OH R=H. R.1=Et. R.2=OH R=OMe, R.1=R.2=OH R=OMe, R.1=R.2=OH R=OMe, R.1=Pr. R.2=OH R=OMe, R.1=Pr. R.2=OH R=OMe, R.1=R.2=OH R=OMe, R.1=R.2=OH R=OMe, R.1=R.2=OH	
	R=H R =Pr R=OMe, R =Pr	

Table -4 Selected Examples of Grignard Reaction with Coumarins

Substrates	Products	Ref
Meo O O O	ArMgBr Meo H	126
R=H R=Me	Ar=Ph, R=H Ar= p-OMeC <sub>6</sub> H <sub>4</sub> , R=H	
	MeO Ar	
	R=H, Ar= Ph R=Me, Ar=Ph R=Me, Ar= p-OMeC H <sub>4</sub>	

Table -4 Selected Examples of Grignard Reaction with Coumarins

Substrates	Products	Ref
MeO — MgBr	MeO O O	127
R= H, R <sup>1</sup> =Me R=Me, R <sup>1</sup> =Me R=H, R <sup>1</sup> = Ph R=Me, R <sup>1</sup> = Ph	R= H, R <sup>1</sup> =Me R=Me, R <sup>1</sup> =Me R=H, R <sup>1</sup> = Ph R=Me, R <sup>1</sup> = Ph	
MeO PhMgBr  Me	MeO Ph Ph	127
MeO Company Co	Et OH  MeO OH  CHCOEt	127
MeO PhMgBr  O Me	PhC Me	127

Table-5 Selected Examples of Grignard Reaction with Coumarins

Substrates	Products	Ref
RMgX (R=Me, Ph)	RIMINA	103, 104
RMgX (R=Ph, CHMe <sub>2</sub> )	OH OR	105
RMgX (R=Me,Pr, Ph, allyl)	OH R R	105
RMgX (R=PhCl <sub>2</sub> CH <sub>2</sub> , i-Pr)	O O O	105
RMgX	OH R OH R R	106, 107
RMgX (R=Ph, p-Anisyl, napthyl)	OH R Me	108, 109

Ph  RMgX R=Et, Me <sub>2</sub> CH, Me <sub>3</sub> C	O Ph	109
	o o o o o o o o o o o o o o o o o o o	
RMgX R=Me	Me Ph Me	110
0 0	OH Me Ph	
RMgX R=1-bromo napthalene	$ \begin{array}{c c}  & & \\$	111
PhMgX CO <sub>2</sub> Et	CO <sub>2</sub> Et	112
	OH O Ph	

RMgX R=p-anisyl	CO <sub>2</sub> Et R	113
RMgX (R=Me <sub>3</sub> C)	CO <sub>2</sub> Et R	114
OH OO RMgX R=Me	OH OH	115
R <sup>1</sup> MgX	OH OH R2	115
R <sup>1</sup> = Et, Me2CH, Cyclohexyl	OH OH R <sup>1</sup>	
R <sup>1</sup> O RMgX R= Me,Ph	R <sup>1</sup> O R R	115
RMgX R=o,m-anisyl	OH R OH R OH	116
RMgX R=p-anisyl	O R	117

## Table-5 Selected Examples of Grignard Reaction with Coumarins

Substrates	Products	Ref
PhMgX X=Br	Ph Ph OH OH	118, 119
RMgX RMgX R=Ph,i-pr R=Ph	O O O O O O O O O O O O O O O O O O O	120
RMgX R=Me	O R R	121
Me O RMgX R=Me	Me O Me Me	122

BrCH <sub>2</sub> (CH <sub>2</sub> )nCH <sub>2</sub> CH <sub>2</sub> MgBr	O (CH <sub>2</sub> )n	123
n=1,2 PhCH <sub>2</sub> MgBr	OH O Ph	124
RMgX R=Me,Et,Ph,Me <sub>2</sub> CH	O C(CH <sub>2</sub> ) <sub>2</sub>	125