High Pure RNA Extraction Technology

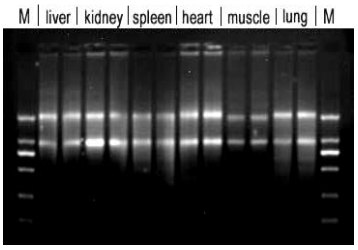
—R4130 HiPure Universal RNA Kit

Introduction

The currently commonly used RNA extraction methods are the acidic phenol guanidine isothiocyanate method and the silica gel column method. Acidic phenol guanidine isothiocyanate, also known as one-step method, was proposed by Chomczymski in 1987 and has been improved into commercial products by many reagent companies, such as Trizol (Invitrogen). The silica gel column purification method uses a glass fiber filter membrane as the substrate to selectively adsorb RNA, while genomic DNA and proteins are removed without adsorption, achieving the purpose of separation and purification. These two methods each have their own advantages and disadvantages (see table below). Magen's HiPure Universal RNA Kits series combines one-step extraction technology with silica gel column purification technology, providing an excellent solution for high-quality RNA extraction. The following table lists the advantages and disadvantages of three methods.

Specification	One-step (Trizol)	Silica Column	Universal RNA Kit
Purity	Medium	High	Highest
Operation Time	1 hour	20 minutes	35 minutes
Toxicity	Phenol chloroform extraction	Safe	Phenol chloroform extraction
RNA recover	Isopropanol precipitation	Column adsorption	
Principle	Extraction	Selective adsorption	Extraction + Selective adsorption
Protein contamination (OD260/280)	High (1.6-2.0)	Low (~2.0)	Lower (~2.0)
Salt contamination (OD260/230)	High (0.5-1.8)	Low (>1.8)	Lower (>2.0)
Polysaccharide contamination	High	Low	Low
Genomic contamination	Trace	Low	Trace
DNase processing method	Cannot be inserted	Can be inserted, digestion on membrane	
Sample Type	Wide	Ordinary	Wide

1. Results of extracting total RNA from animal tissue samples

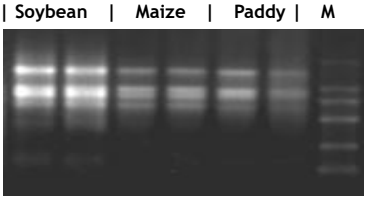


Take 50mg chicken tissue samples and extract them by HiPure Universal RNA Kit. After extraction, use Nanodrop 2000 and agarose gel electrophoresis for analysis. From the results, it can be seen that the RNA obtained using this method has high purity, high yield, and good RNA integrity.

Sample	Conc. μg/μl	260/280	260/230	Yield μg
Liver	0.4231	2.11	1.94	169.2
Liver	0.4538	2.07	1.98	181.5
Kidney	0.2599	2.08	1.99	103.9
Kidney	0.2573	2.06	1.99	103.7
Spleen	0.6382	2.11	2.28	127.6
Spleen	0.6383	2.11	2.06	127.7
Heart	0.3654	2.13	1.96	73.1
Heart	0.3342	2.11	2.41	66.8
Muscle	0.0334	2.1	1.99	6.7
Muscle	0.0558	1.82	2.57	11.2
Lung	0.1738	2.09	2.02	34.8
Lung	0.162	2.08	2.21	32.4

2. Results of extracting total RNA from plant samples

Take 100mg of soybean, maize, and paddy leaf samples, and extract them by HiPure Universal RNA Kit. The OD value is measured using Nanodrap 2000, and the band pattern of the large molecular RNA is analyzed using 1.2% agarose electrophoresis.



Sample	Conc. μg/μl	A260	A280	260/280	Yield μg
Soybean	0.3617	9.043	4.123	2.19	72.34
	0.4051	10.129	4.612	2.2	81.02
	0.062	1.55	0.752	2.06	12.4
Maize	0.0497	1.242	0.598	2.08	9.94
	0.0729	1.822	0.861	2.12	14.58
Paddy	0.0669	1.672	0.788	2.12	13.38

Comparison between Magen R4130 and other brands of reagents

Company	Sample amount	Conc.	Unit	260/280	260/230	Yield μg
Magen R4130	Liver(50mg)	0.362	μg/μl	2.14	2.12	173.8
	Liver(50mg)	0.335	μg/μl	2.13	2.16	160.7
Qiagen	Liver(50mg)	0.333	μg/μl	2.13	1.66	159.9
	Liver(50mg)	0.345	μg/μl	2.12	1.65	165.7
Invitrogen	Liver(50mg)	0.337	μg/μl	2.13	1.96	162.0
	Liver(50mg)	0.360	μg/μl	2.13	1.75	172.8
Omega	Liver(50mg)	0.328	μg/μl	2.14	1.73	157.3
	Liver(50mg)	0.360	μg/μl	2.15	1.71	172.8
Company	Sample amount	Conc.	Unit	260/280	260/230	Yield μg
Magen R4130	Heart(50mg)	0.157	μg/μl	2.12	1.34	15.7
	Heart(50mg)	0.141	μg/μl	2.13	1.52	14.1
Qiagen	Heart(50mg)	0.148	μg/μl	2.13	1.17	14.8
	Heart(50mg)	0.149	μg/μl	2.11	0.95	14.9
Invitrogen	Heart(50mg)	0.133	μg/μl	2.12	1.43	13.3
	Heart(50mg)	0.153	μg/μl	2.11	1.39	15.3
Omega	Heart(50mg)	0.154	μg/μl	2.06	0.73	15.4
	Heart(50mg)	0.131	μg/μl	2.1	1.15	13.1