

# Total Carbohydrate Colorimetric Assay Kit

rev. 7/14

(Catalog # K645-100; 100 assays; Store at 4°C)

## I. Introduction:

Carbohydrates play important structural as well as chemical roles in all living systems. Detection of total carbohydrates, therefore, has wide applications. BioVision's Total Carbohydrate Assay is a simple, sensitive and robust method of detecting virtually all carbohydrates. The assay is based on the phenol-sulfuric acid method. In Total Carbohydrate Assay, polysaccharides (mono, di, tri, etc.) and their derivatives, in the presence of sulfuric acid, are hydrolyzed to monomers and converted to furfural or hydroxyfurfural, which react with the Developer to form a chromogen that can be quantified by measuring the absorbance at 490 nm. The Total Carbohydrate Assay can detect most forms of carbohydrates, including simple and complex saccharides, glycans, glycoproteins and glycolipids.



## II. Application:

- Measurement of total carbohydrate in various samples.

## III. Sample Type:

- Adherent or suspension cells
- Animal and plant tissues
- Food products, fruit juices & other beverages

## IV. Kit Contents:

Components	K645-100	Cap Code	Part Number
Assay Buffer	25 ml	WM	K645-100-1
Developer	3 ml	Brown Bottle	K645-100-2
Standard (D-Glucose, 2 mg/ml)	0.2 ml	Yellow	K645-100-3

## V. User Supplied Reagents and Equipment:

- Concentrated H<sub>2</sub>SO<sub>4</sub> (98%)
- 96-well clear plate with flat bottom
- Temperature controlled Heat Block
- Multi-well spectrophotometer (plate reader)
- Safety goggles and gloves

**Caution:** H<sub>2</sub>SO<sub>4</sub> is highly corrosive and oxidizing; handle with protective clothing, goggles and gloves etc. Do not add water to concentrated acid.

## VI. Storage and Handling:

Warm Assay Buffer to room temperature before use. Developer is stable at room temperature.

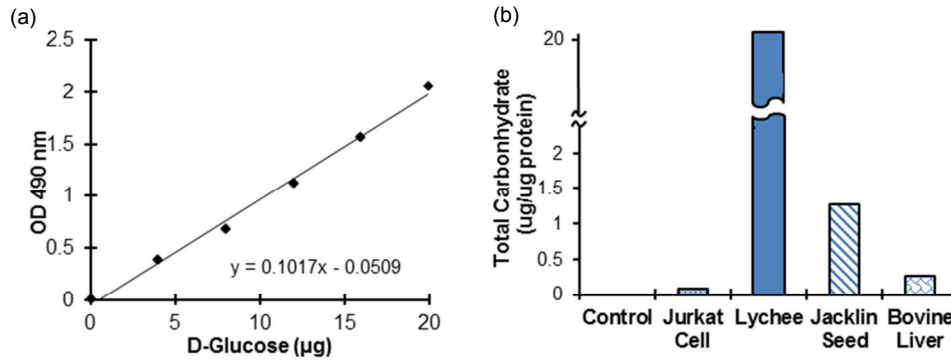
## VII. Carbohydrate Assay Protocol:

- 1. Glucose Standard Curve:** Add 0, 2, 4, 6, 8 and 10 µl of Glucose Standard into a series of wells of 96-well microtiter plate to generate 0, 4, 8, 12, 16 and 20 µg/well of Glucose Standard. Adjust volume to 30 µl per well with dH<sub>2</sub>O.
- 2. Sample Preparation:** Liquid samples can be measured directly. Homogenize tissue (50 mg) or cells (1 x 10<sup>6</sup>) with 200 µl ice cold Assay Buffer. Centrifuge at 12000 rpm for 5 minutes. Collect the supernatant. Add 1-30 µl of sample per well and adjust the volume to 30 µl with dH<sub>2</sub>O.  
**Note:** For unknown samples, we suggest testing several doses of samples to ensure the readings are within the Standard Curve range.
- 3. Reaction:** Add 150 µl concentrated H<sub>2</sub>SO<sub>4</sub> (98%, not provided) to Standard and sample wells, mix for one min on a shaker and incubate at 90°C for 15 min. After 15 min, add 30 µl Developer. Mix on shaker for 5 min at room temperature.
- 4. Measurement:** Mix the contents for 1 min. and measure OD at 490 nm.
- 5. Calculation:** Subtract 0 Standard from all readings. Plot the Glucose Standard Curve. Apply the sample OD to the Standard Curve to get B µg of total carbohydrate (glucose equivalent) amount.

$$\text{Total carbohydrate concentration in the sample} = B/V \times \text{Dilution Factor} = \mu\text{g}/\mu\text{l or mg/ml}$$

Where: **B** is the amount of total carbohydrate from Standard Curve (glucose equivalents).  
**V** is the sample volume added into the reaction well (µl).

Total carbohydrate concentration in samples can also be expressed in µg/µg of protein or mg/gram of sample.



**Figure.** D-Glucose Standard Curve (a). Total carbohydrate concentration in jurkat cell lysate, lychee, jacklin seed & bovine liver respectively (b). Assays were performed following kit protocol.

**VIII. RELATED PRODUCTS:**

- Glucose Assay kit
- Glucose Dehydrogenase Activity Assay Kit
- Glucose-6-Phosphate Dehydrogenase Assay Kit
- Glucose Uptake Colorimetric Assay Kit
- Glycogen Assay Kit
- Maltose and Glucose Assay Kit
- NADP/NADPH Quantification Kit
- Phosphoglucose Isomerase Colorimetric Assay Kit

- Glucose and Sucrose Assay Kit
- Glucose-1-Phosphate Colorimetric Assay Kit
- PicoProbe™ Glucose-6-Phosphate Assay Kit
- Glucose Uptake Fluorometric Assay Kit
- Hexokinase Colorimetric Assay Kit
- NAD/NADH Quantification Kit
- Phosphoglucomutase Colorimetric Assay Kit
- Starch Assay Kit

**FOR RESEARCH USE ONLY! Not to be used on humans.**